REASON, THOUGHT
AND LANGUAGE

OR

THE MANY AND THE ONE

A REVISED SYSTEM OF LOGICAL DOCTRINE
IN RELATION TO THE FORMS OF
IDIOMATIC DISCOURSE

BY

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PREFACE

SPECIALISTS in what is sometimes spoken of disparagingly as Formal Logic have of late been almost as scarce as canonists or line-engravers. I therefore deem myself very fortunate to have been allowed to submit the first draft of this book to the expert criticisms of my friend, Mr. St. George Stock, M.A., of Oxford, who went through it in manuscript with his usual acute vigilance. If any errors, other than those of judgement, be detected in it, they have probably crept in during the rewriting of the work.

These pages represent an effort to strengthen and revivify Formal Logic—though I do not admit that Logic can be anything but formal—by bringing it into closer connexion with the living facts of thought and speech. I have been bold enough also to think that both ancient and recent views upon various parts of logical theory require examination, and that the entire subject can be with advantage rehandled. The shield which I have especially desired to touch by way of challenge is that of the 'new logicians' who hold that there can be reasons without Reason, as well as that of the traditional Logic which makes the implicit explicit without the help of a middle term. Except in the light of what is universal thought cannot exist.

Although I have assumed some acquaintance with the elements of Logic, I hope the exposition here presented

will not prove too technical for any intelligent reader. The historical aspects of the subject are ably treated of in established philosophical works, and are here merely glanced at. If an occasional repetition be complained of, I would plead that no one reads a treatise of this kind straight through—*stans pede*, as I may say, *in uno*. If on the other hand some *lacunae* are noticed, let it be remembered that, in Voltaire's phrase, 'le secret d'ennuyer est celui de tout dire.' I have exposed quite a large enough surface to the arrows of criticism, and cannot feel confident that none will find their way home. If any penetrate, I trust, at least, that they will have pierced, not a skeleton of dry bones, but flesh and blood.

CODFORD ST. PETER, WILTS.

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ERRATA

Page 72, note 1, line 11, *for* say truly *read* I say truly

P. 95, page-heading, *for* a Necessary *read* as Necessary

P. 134, n. 1, last line, *for* ζᾳα *read* ζῷα

P. 152, § 324, l. 3, *insert comma after* richest

P. 157, n. 3, last line, *for* corregiosity *read* correggiosity

P. 178, § 389, l. 7, *for* Lotze *read* Lötze

P. 216, n. 1, last line, *for* Il a *read* Il y a

P. 357, n. 1, l. 4, *for* preicdated *read* predicated

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P. 480, l. 12, *for* dominate *read* dominant

CHAPTER I

INTRODUCTION

§ 1. IF it be the case, as an eminent logician of the new school complains, that throughout the modern textbooks Logic is in a chaotic condition, exhibiting an astonishing diversity of opinion about its province and methods, there may be room for yet another treatise, which shall at least attempt to work out in detail a single and consistent view. The ideal which I set before me is that of a Logic which shall be more consistently formal than the Aristotelian and scholastic tradition, yet in intimate touch with the realities of human thought and language.

§ 2. 'Logic,' observes Dr. Bosanquet, 'has a hard task to hold its own against Metaphysics and Psychology.'[1] It starts from the assumption of Reality and moves in the sphere of Mind. Nevertheless its conclusions are the same whatever view we take of the nature of Being and by whatever faculties we perceive and think. The older logicians mingled ontological conceptions with the science. The recent tendency has been to confuse it with epistemology, 'tracing the evolution of Knowledge in the light of its value and import,' from the first glimmer of awaking consciousness to the ordered hierarchy of the sciences, the greater and lesser thrones of Wisdom. Now the basis and presupposition of Logic, no doubt, is metaphysical—that fundamental nature of Reality, that imperativeness of Truth, which imposes upon Thought the obligation of self-consistency. Still, this obligation is postulated by the logician, not proved.[2] He does not try to pierce the veil to a knowledge of the ultimate Real. And with other questions connected with Being, such as essences and accidents, the relations of substance and quality, the meaning of causality, of necessity, of good and evil, of space and time, of personality—what God is and what man is—, he

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[1] *Logic*, i. 247.
[2] 'Logic does not investigate the truth, trustworthiness, or validity of its own principles. This task belongs to Metaphysics.'—Sidgwick, *Use of Words in Reasoning*, p. 8.

is not at all, or only incidentally, concerned. Similarly, while tracing the rational connexions of Thought, Logic is bound, indeed, to accept help from outside in taking the thinking act, to some extent, to pieces. It is only interested in the concept and the judgement as products; yet, to understand these products, it must scrutinize conceiving and judging as processes. On the other hand, Logic does not concern itself with mental, any more than with physical, phenomena *as such*, as contingently thus or thus. The constitution of Mind is for the psychologist to determine, as the nature of Existence is for the metaphysician.

§ 3. Nor yet again must Logic be confused with Method. Dr. Bosanquet, for instance, contends that

'The subject matter of logic is Knowledge *qua* Knowledge, or the form of knowledge. It is quite essential to distinguish the form of knowledge in this sense from its matter or content. The "matter" of knowledge is the whole region of facts dealt with by science and perception . . . The phrase "Science of Sciences" does not mean that Logic is a Science which comprises all the special sciences, but that Logic is a Science dealing with those general properties and relations which all sciences *qua* sciences have in common. . . . Thus, not the nature and affinities of the plant-world, but classification, explanation, observation, experiment, theory, are the phenomena in virtue of which the organized structure of botanical science participates in the form of knowledge, and its objects become, in these respects, objects of logical theory.'[1]

Accordingly he maintains that the form of knowledge (identified with logical form) 'depends in some degree upon its matter'. The employment of symbols to represent logical processes is therefore, he considers, of very limited utility.

§ 4. Except that reasoning supposes a universal element in thought, I hold that Logic is no more Science than it is the sciences. Classification, explanation, observation, experiment, theory, are governed by logical laws. But Logic cannot tell us how to observe, theorize, and so forth, successfully. Or if it can do so, it must be some other branch of inquiry which analyses the purely formal relations of thought as connected rationally. Why should the new Logic, the 'Logic of Truth', treat the old Logic with contemptuous toleration as a humble relative who has seen better days, when the two inquiries have

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[1] *Essentials of Logic*, Lecture III.

really nothing to do with one another?[1] The hedge-sparrow squeezed into a corner is not related to the cuckoo, its intrusive guest, nor under any obligation to drudge for it.

§ 5. And yet there may be something worth weighing in the 'opposition to Formal Logic' announced by writers like Mr. Alfred Sidgwick. He tells us that 'formal logicians assume that the logical character of a word, or of an assertion, belongs to it quite independently of its context'. They seem to think that 'a sentence which is intended to express an assertion is the same thing as the assertion which that sentence is intended to express',[2] and that 'forms of sentence have some peculiar virtue which binds assertor and audience equally to a single indisputable meaning'; whereas 'the most effective source of fallacy and dispute is always the failure to get our meaning clear'.[3] To ask for the precise interpretation of a sentence, which is only the assertion's outer husk, ought not, he urges, to be regarded as going outside Logic. We must not be forbidden, then, to examine the matter asserted. We must not head off and starve inquiry by prohibiting excursions into the domain of psychology or of metaphysics, lest we so 'cramp Logic that it becomes a mere collection of misleading formulas, coupled with a little elementary grammar'.[4] 'The traditional conception of a reasoning process as something separate from its subject matter sterilizes the inquiry into the nature of good and bad reasoning.'[5]

§ 6. There appears to be some confusion here between ascertaining the meaning of a proposition and inquiring into the objective nature and actual relations of the subject matter.[6]

[1] Mr. A. Sidgwick, while advocating 'that larger and deeper study of Logic which is sometimes called the Theory of Knowledge', confesses that it is 'to a great extent incompatible with the objects of the formal logician'. No doubt, until we reach the ultimate facts of consciousness, the *primum cognitum*, every judgement, as having a ground, is partly an inference. But the separation of the inferential form from the judged content is the very object of Logic, and is a wholly different inquiry from an investigation of the bases, conditions, processes and faculties involved in Cognition. If the logician has not to inquire what the world is in itself, neither has he to ask how we perceive it, nor in what way we can best arrange our knowledge of it.

[2] *The Use of Words in Reasoning*, p. 17.

[3] Ibid. p. 19.   [4] Ibid. p. 9.   [5] Ibid. p. 10.

[6] For the Matter of reasoning as contrasted with its Form, see below, § 350.

Invalid reasoning, says Mr. Sidgwick, 'lies in the subject matter. It is no use considering the form alone.'[1] But he will not, I think, deny that the argument, 'Cats are dogs, dogs are animals, therefore cats are animals,' is perfectly valid *reasoning*, and leads to a conclusion not merely correct but true.[2] What he intends, no doubt, is that we must look to the meaning of a proposition and not simply to its verbal expression. The textbooks, he says, 'keep alive the notion that formality is the strength of Logic instead of its weakness.'[3]

§ 7. Now, the strictest formalist even of 'the childish or mediaeval Logic' knew very well that he had to deal with thoughts rather than sounds or marks upon paper, and that, if a pound is sixteen ounces and stray pigs are kept in a pound, it does not follow that stray pigs are kept in sixteen ounces. But we have all met the pedantic stickler in common life who informs us that an argument is illogical, through some trifling irregularity; as when we are not allowed to say that bad workmen complain of their tools, and that therefore, since X does so, he must be a bad workman—where no doubt we have been technically guilty of 'undistributed middle'; but we meant 'bad workmen, and only they, complain'. And certainly the older Logic, taking little notice of such sub-auditions, was somewhat wooden and unpractical. Still, one of the uses of Logic is to make men express themselves accurately, affording them the opportunity of restating their reasoning if necessary. Logic and common sense have to help one another. The former shows the latter, when puzzled, what tests to apply to any reasoning. The latter suggests to the former what the real import is of the materials supplied to it. Again, we often instinctively see the bearing of a complicated point while the

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[1] Op. cit. p. 12.

[2] All reasoning is formal, not because it exhibits a form or because it excludes matter, but because, in Mansel's words, the reasoning act 'is based on the form only of the preliminary *data* without reference to the particular matter. . . . So long as the formal relation of the *data* remains the same, the matter may be changed as we please, without affecting the logical value of the thought. . . . For this reason, all examples of logical thinking are better expressed by means of arbitrary symbols than of significant terms : not that it is in any case possible to think without some matter or other, but because it is wholly indifferent what matter we may at the time be thinking about' (*Prolegomena Logica*, 1st ed. pp. 242-4).

[3] Op. cit. p. 7.

formula 'All *X* is *Y*' and its three blind brothers are hobbling a long way behind.

Again, apply the syllogistic formula, 'All *Y*'s are *Z*; *X* is a *Y*; then *X* is *Z*,' to the following example—'All dogs come into the world blind. Ponto is a dog. Then Ponto comes into the world blind.' We want *came* not *comes*. It has to be pointed out, then, that a General Proposition is such, either as making a concrete statement about the members of a class generally—as in the illustration just given—, or as making a general statement about a concretely designated object or objects—e. g., 'My three houses always let easily'—, or as making a general statement about a class generally—e. g., 'all cats (always) lap.' The conventional formula for syllogism fits general predication in the second and the third sense only. Nor will '*X* is always, or invariably, *Y*' suit no. 1 any better. We seem to want something like—' It is the nature of *X* to be *Y*.'

Here is an argument—' Bibamus, moriendum est.' And here a universal *A* proposition—' Me duce, tutus eris.' And here, though imperative, an *E* judgement—' Ne sus Minervam.'

§ 8. So long as Logic remains in a symbolic shape, no question, of course, can arise about the content of the terms of any proposition, though many difficulties and ambiguities may attach, as we shall see, to the verbal signs of quantity and quality and to the various phrases by which the attribution of *Y* to *X* can be expressed. 'A term is any name or combination of names and words describing the qualities and circumstances of a thing' (Jevons). It ranges from a bare individual indication or pronoun—'that object': ' she '—to the most complicated bundle of grammatical clauses within one conception. A purely symbolic Logic not only leaves the content of the propositional terms empty of significance, but requires the great variety of relations between the terms, *in which relations the form of the thought consists*, to be given in one or other of four moulds, usually expressed in the forms—All *X*'s are *Y*, some *X*'s are *Y*, no *X*'s are *Y*, some *X*'s are not *Y*. A very useful Logic, like Dean Aldrich's, may be constructed within these limits ; and it was indeed an immense philosophic achievement when 'the master of them that know' first excogitated the bare skeleton forms into which all argumentation in every language can be thrown, displaying the laws of rational consecution between

thought and thought. It was much to enable men to challenge an opponent to bring into the light the hidden ground of any assertion, to complete his syllogism, to exhibit his reasoning in one of the regular analyses, and, thus dissected, to submit it to formal tests. A simple norm of ratiocination demands for its elements simple norms of judgement. And these the 'traditional Logic' framed, and built up into an inexpugnable system.

§ 9. But, in the first place, while undoubtedly there is such a thing as an abstract form of thinking, no syntactical type of sentence—such as '*X*'s are *Y*'—has an absolute right to be regarded as its representative. The same thought is equally well expressed by '*Y*-ness is predicable of *X* things'; or by, 'The possession of *X* quality carries with it the possession of *Y* quality'; or by, 'Where *X* is found *Y* is found'; or in other ways. For the marks of quantity, *all, some, not any, not all*, we may substitute *always, sometimes, never, not always* (*sometimes not*), or other modes of expression, more or less complicated. 'All *X*'s are *Y*' is the same mental judgement as 'only *Y*'s are *X*', and the following pair of syllogisms are identical in reasoning :—

Every *M* is *P*	None but *P*'s are *M*
Some *S*'s are *M*	*S* is in some cases *M*
Therefore some *S*'s are *P*	Therefore *S* is in some cases *P*.

If the latter type were adopted, the usual scheme of moods and figures would seem at first sight dislocated ;[1] but this syllogism comes out in the second Figure, in the mood *Festino* with a negative subject-term—

> No not-*P*'s are *M*.
> *S* is sometimes *M*
> Therefore *S* is sometimes not not-*P*.

Now, 'None but the brave deserve the fair' expresses what is meant at least as simply as 'Every one who deserves the fair is brave', and 'Only the industrious will be relieved' is at least as intelligible as 'All who will be relieved are industrious'.

The missing premiss of 'It is Jehu, the son of Nimshi, for he driveth furiously', is more naturally expressed in the form, 'Only Jehu drives furiously,' than in the form, 'All who drive furiously are Jehu.'

[1] See Appendix H.

§ 10. The laws of ratiocination are the same, whatever type of propositional formula we select. But it is more obvious, to take an example, that in 'All X's are Y' Y is undistributed than it is in 'None but Y's are X', which is rationally the same judgement. Again, 'Only the wise are free' is equivalent to 'All who are free are wise'; but ''Tis only noble to be good' is tantamount to saying, 'All who are noble are good', not 'All who are good are noble.'

§ 11. Secondly, no set of logical formulas will enable us to analyse the complexities of actual thought and speech, or to expose without further help any but the simplest fallacies. The symbolic Syllogism is unequal to the subtilty not only of nature but of thought.[1] In such an argument as Montaigne's 'Je l'aimais parceque c'était lui, parceque c'était moi', a real process of reasoning is concealed; but it is not easy to exhibit it formally. Even 'Here am I, for thou didst call me' is not quite so simple as it looks. Nor 'Be ye holy, for I am holy'. Or take the following syllogism :—

Hoc ita iustum est si est voluntarium.

Iustum est. Ergo est voluntarium.

This is really in Figure I, the major premiss being equivalent to 'Omne iustum voluntarium est'. Or take this :—

Nemo fere saltat sobrius nisi forte insanit.

N sobrius est et saltat. Ergo insanit.

More fully—

Nemo non-insaniens sobrius est et saltat. ·

N sobrius est et saltat.

Ergo non est non-insaniens (i. e. *insanit*).

Symbolically—

No non-Y is X and also Z (no non-YX is Z).

N is X and also Z. Therefore N is not non-Y.

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[1] Here is a sentence taken at random from a letter written by Laud to Sir Kenelm Digby :—'It is not your-change (A) that-can-change-me (B); who (C) never yet left (D) but where-I-was-first-forsaken (E), and not always there (E).' The sentence contains three propositions— no B is A; no non-EC is D; some EC is not D. The thing that can change me is not your change: no case where I was not first forsaken was ever a case of my leaving; and some cases where I was first for- saken are not cases of my leaving (in the past). And here is a familiar concept :—'God (X) without-whom (non-X) nothing is strong (Y), nothing is holy (Z)'=an X of whom it is the case that no non-X is Y and no non-X is Z ;=a (non-X is non-Y) (non-X is non-Z) X !

More simply—

> Every *XZ* is *Y* (Every sober dancer is mad)
> *N* is *XZ*.   Therefore *N* is *Y*.

Sobrius means *non-ebrius*, not tipsy: and, if we represent it by non-*X* instead of *X*, the syllogism will have a still more complicated and artificial look.   Nevertheless the reasoning is transparent and usual.

§ 12. The following seems to follow rule, yet it is absurdly vicious:—'All Cabinet ministers are human.   Just nineteen politicians are Cabinet ministers.   Just nineteen politicians, then, are human.'   In the following the major term has the appearance of being less extensive than the middle, and the middle than the minor—'20 pennyweights are an ounce troy; an ounce troy is $\frac{1}{12}$ of a pound; then 20 dwts are $\frac{1}{12}$ lb.'

§ 13. Miss Trotwood's 'Donkeys!' implied a complete syllogism.   On the other hand, many reasonings seem to have four terms.   'You must be quick with your letter, for the postman is waiting.'   'As the wind is so cold, I shall wrap up.'   We shall have also to examine numerical, and what Hamilton calls ultra-dimidiate, inferences.   De Morgan declares plausibly that any one who sticks close to Aristotle's rules will be unable to prove that, if most men have coats and most have waistcoats, some men have both.   Jevons's wooden toy for getting and testing conclusions from premisses could better deal with this class of arguments, however, than with many others.

§ 14. The 'mere logician' is certainly not bound to interpret and arrange men's thoughts for them, or to point out the defect in any confused piece of reasoning as it stands.   The interpretation of language is a necessary preliminary to his examination of the connexion of the thought.   He can claim to have the argument enounced in full before giving his verdict upon it. Thus the following lament of Lord Burleigh is a syllogism in the Second Figure—

> Ease and pleasure quake to hear of death;
> But my life desireth to be dissolved.
> (It follows that) my life is full of cares of miseries.

But we can demand that the expressions shall be formalized. I agree, however, that a logic *in vacuo*, wholly unrelated to actual difficulties and complexities of reasoning, what Sidgwick calls a fair weather Logic, applicable where no doubt or difference

of opinion has entered but helpless just at the point where question arises, needs to be supplemented, or rather illustrated, by an analysis of actual arguments and forms of speech. Reason in itself is absolute and universal; yet being for human beings intimately connected with human thought, it must exhibit its unity in and through the varying structure of thoughts.[1] The practising logician, ever seeking behind the accidental parlance the necessary sequence of idea, studies the idiomatic expression of thought, with which, however, and not with the expression, his concern truly lies.

§ 15. This necessity of dealing with thought through language does not destroy the essentially formal nature of logical inquiry. Logic is formal because the validity of an argument does not depend on what we happen to know, outside the *data*, of the actual properties of the objects about which we are speaking, but on the rational connexion between premisses and conclusion. It is the same thing to the logician whether he is presented with such a proposition as, 'It never rains but it pours,' or such as, 'It never thaws but it freezes'—until he is told that thawing and freezing are contraries. He does not care whether the conclusion that Socrates is mortal is reached by affirming that Socrates is a man and all men are mortal, or from the premisses that Socrates is a fish and all fish are mortal. If, on being told that water is nothing but H_2O, I go on to conclude that Thames water is nothing but H_2O, he will check me with a caution about *dicta simpliciter* and *dicta secundum quid*; but not because he happens to know that Thames water when analysed is found to be that and a great deal more. He declines to disallow concepts such as 'Greek kalends', 'fricassé dans la neige', 'strawberries in the sea and herrings in the wood', or propositions like Proudhon's 'The true form of State is anarchy', or 'She had been vexed if vexed she had not been', until the incompatibilities which may exist in them are formally presented. Directly we go outside our *data*, we are appealing to the matter

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[1] The anti-scientific school now fashionable denies the unity. 'Our main principle will have as many forms as there happen to be categories or kinds of relation' (Bradley, *Logic*, p. 242). This school seizes triumphantly on reasonings like this—'Ten were killed and five wounded; so that twice as many were killed as were wounded'—to expose the sacerdotal pretensions and exploded tyranny of the Major Premiss.

not to the form, to external experience not to internal rational necessity. Logic, in a word, is concerned with the necessary validity of consequences rather than with the contingent truth of assertions, with proofs rather than with circumstances.

§ 16. 'Formal' Logic is, then, the only Logic. Such a science is often disparaged as narrow and narrowing.[1] To be sure, a river which has broken its banks and flooded the country-side has acquired breadth by such expansion; yet it is good engineering to coerce it within its proper channel. We have nothing to do with broad and narrow in philosophy. The inquiry what it is gives the inferential connexions of thought their legitimate force and right may conceivably be not worth undertaking. But if it is to be undertaken it must be kept scrupulously apart from investigation and co-ordination of the laws, however general, of phenomena, and from the grouping of them under the categories of human sensibility and under-standing.

§ 17. But a fertile field lies before the logician in the daedalian richness of human thought and speech—which is not only thought's expression but its mould. The foot shapes the shoe, and the shoe shapes the foot. We speak as we think; but also, to a great extent, we think as we speak : that is to say, our thinkings run in the moulds prescribed by inherited syntax. Language implies Conception, and reacts on our conceptional powers, to develop and shape them.

§ 18. The question whether Language is necessary to Thought hinges on the possibility of framing general conceptions which are not fixed in a representative sign—words, or other significant marks, being, as Sir William Hamilton felicitously says, the entrenched and fortified positions which enable Thought, its spadework done, to advance into new territory. The question about the connexion between Thought and Language is for Logic, however, less about the content of terms than about the formal relations of terms in the proposition. It is not names that give

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[1] Not, however, it should be observed, by Mill, who says :—' I know of nothing, in my education, to which I think myself more indebted for whatever capacity of thinking I have attained, than early practical famili-arity with the school logic. I am persuaded that nothing in modern education tends so much, when properly used, to form exact thinkers. The boasted influence of mathematical studies is nothing to it' (*Auto-biography*, p. 19).

the logician most trouble. He could construct a very living science with the help of three letters of the alphabet. But it is when he tries to express the multitudinous aspects of predication by algebraic or other symbols, or by the bald and simple forms of the 'traditional logic', that he gets out of touch with the multifarious activity of real thought. 'All X's are Y', for instance, has to stand for such propositions as, 'It never rains but it pours' (no not-Y is X); 'Everybody's business is nobody's business'; 'Obsta principiis'; 'One good turn deserves another'; 'You shall want ere I want'; 'Other days bring other ways'; and a myriad other expressions, a number of which I have suggested later and in an appendix. 'No X is Y' must represent such propositions as these :—'Liberty is one thing and licence is quite another'; 'Stemmata quid faciunt?'; 'God befriend us as our cause is just'; 'Vendredi chair ne mangeras'; and so forth. The logician has to point out that 'One man (should have) one vote' is not a singular proposition, nor 'Tres faciunt collegium' a plural one, nor 'The many fail, the one succeeds' a combination of plural and singular '—all these being general propositions, as also is 'Two's company, three's none'. He has further to find room under the same formula, 'Every X is Y', for general propositions ('every X' = all X's) and for concrete universals ('every X' = all the X's). Probable and Modal judgements have also to be considered. Then, there are Narrative judgements ; also Added Determinants—in which the knot is not always so easily untied as in, 'Englishmen wear clothes; then old Englishmen wear old clothes'—, and Exceptive and Exclusive arguments. The Swedish agent's complaint, 'Only one man in England can write Latin, and that man blind,' cannot without weakness be carried to the conclusion, 'Then only one blind man in England can write Latin.' Rules of Inductive Inference will have to tell us why, 'This liquid poisoned M yesterday; therefore it will poison N to-day,' and, 'This liquid scalded M yesterday; therefore it will scald N to-day,' are not on all-fours.

§ 19. A universal Logic is possible because a universal Grammar is possible, the basal structure of thought being the same for all mankind. But this underlying unity admits of an immense variety of idiomatic peculiarities—for instance, the impersonal forms of speech of the Japanese. To the Greek

logicians, among whom linguistic study was in its infancy, all non-Hellenic tongues were barbarous. The mediaeval writers on Logic wrote for the most part in Latin, with its clear-cut and inelastic syntax. The comparative study of languages has now made great advance; yet even in England, which has a speech grammatically poor but opulent and imaginative of phrase, logicians have seldom departed from the trifling round of inherited illustration, based on the idea of a fixed natural order of concepts,—'Man is rational,' and the like—unless it be to devise examples of the pseudo-scientific and 'useful' kind, conveying incidental information about monocotyledonous plants, rhomboidal spar, mercury, carbon, and the Aryan race. The form of such illustrations is usually too easy for our purpose. A hundred times more exercise would be afforded to the logical student by a Shakespearian comedy or the talk of two children at play. The mediaevals, for all their limited range of illustration, were right to associate Logic in their academic Trivium with Rhetoric and Grammar. It is in this direction that the future of Logic as, in one sense, a progressive science should, in my opinion, be looked for.

§ 20. Logic has to a great extent emancipated itself from the hewing of wood and drawing of water for experimental science, which the sensationalist school regarded as its proper menial service, though Mansel could say in 1851:—'The slave has broken prison, but the master has not yet relinquished his claim, and the fugitive still carries about him some links of his chain by which ever and anon some emissary of his former tyrants seeks to drag him back to the burdens and the flesh-pots of his servitude.'[1] Since Kant, the opposite tendency, that of developing the matter of thought from its form and of identifying Thought and Being, has had greater influence, but is equally fatal to pure Logic.

§ 21. No doubt, Logic cannot be 'formal' if Mr. Sidgwick is right in his ultra-Nominalist contention that there is no abstract law of rationality—no 'entity' of reasoning—distinct from thought's subject matter; for, he says, 'to imagine that because we can speak of things in the abstract therefore abstractions have independent existence is to forget that they are, after all, abstractions.'[2] He complains that 'the textbooks generally

[1] *N. British Rev.*, vol. xv, No. 29.   [2] *Use of Words*, pp. 10, 20.

assume that all the doctrines of Logic may be deduced from axioms as undeniable as those of Euclid, and that unless this is done the "scientific foundation" is absent '.[1] He speaks of 'the so-called laws of thought'.[2] 'The generalisations of Logic are only roughly true.'[3] He grants that the Syllogism is 'not a wholly useless piece of logical lumber'. It contains a truth 'which, when the proper precautions are taken, may perhaps be found not entirely useless'.[4] Yet it is mechanical and standstill.

§ 22. On the other hand, in view of the modern attack from so many quarters upon middle terms, that is, upon reasoning through universals, the 'formal logician' cannot but be consoled by the following words of Mr. Sidgwick :—

'The leading idea of the Syllogism is the recognition that where any fact is produced as sufficient to prove a conclusion, the sufficiency of such fact for such purpose depends on the acceptance of a generalisation which covers it and connects it with the conclusion. No doubt this is an extremely elementary truth. It . . . is part of the constitution of any mind that forms a judgment about concrete affairs . . . However far we develop our Logic, we cannot outgrow our early acceptance of the axiom that every particular case has a general rule behind it, and the corollary that proof consists in finding a general rule to cover the particular case.'[5]

Elsewhere the same writer remarks that, as requiring (1) a principle and (2) the application of such principle, ' all rationalisation may be represented syllogistically.'[6]

§ 23. The rules of the textbooks are merely the elucidation of this statement, which gives the 'formal logician' all that he really asks. Having it, he may admit that the older Logic insufficiently recognized the difficulty of making the framework of abstract formulas fit the diversity of actual thinkings, and also that the concealment of real complexity under verbal simplicity is one of the most frequent sources of fallacy. We want a dialectical casuistry to deal with the refinements and subtilties of thought and speech. The problem which, Mr. Sidgwick remarks, ' is always troubling Logic and which never troubles Geometry, the difficulty of using your definition to tell you precisely how some doctrine shall be interpreted in particular cases,' must be grappled with. Thus arises the true applied

[1] Op. cit. p. 6. [2] Ibid. p. 20. [3] Ibid. p. 57. [4] Ibid. p. 72.
[5] Ibid. p. 72. [6] *Fallacies*, p. 111.

Logic, the *logica utens*, which in no way resembles the utilitarian Logic of Ramus, Locke, Stewart, Mill, and Bain.

Recently an anarchical school of logicians has established itself, which throws dirt and stones at the Syllogism, rails at rules, and overthrows a philosophy in a footnote. I trust I have done justice to that 'synthetic activity of Thought' by which it is sought to supersede the dethroned syllogistic reasoning. But the movement against major premisses is an endeavour to remove the linch-pin of connected thinking—that is, of Thought itself.

CHAPTER II

THE JUSTIFICATION OF ANY THOUGHT

§ 24. THE subject of Logic is Rational Consequence in Thought. The consequential *nexus* in all thinking is Reason. Logic, then, investigates the Law, or Laws, which Reason imposes upon the connexions of Thought. To do this it must to some extent analyse the thinking act. Is judgement an equation of values —as when we say 'ten shillings are half a sovereign'? Is it an identification, even when conceptually expressed—so that 'patience is a virtue' identifies patience with a particular virtue? Or is it conceptual, the placing of an object under a conception, even when expressed as an identification—so that 'L'État c'est moi' brings the State under the idea of Louis XIVth's person? Or is it sometimes one and sometimes another? Hobbes in his *Computatio sive Logica* makes all judgement and all reasoning to be an addition or subtraction sum.

§ 25. An analysis of conception and judgement is therefore necessary; but only so far as is required for the purpose of detecting in what way the imperative of Reason is obeyed in this, that and the other sequence of thought. The logician leaves it to the psychologist to scrutinize further the inner mechanism of our mental faculties, the secret workshop of our consciousness. He is only concerned with the formal relations of thoughts regarded as products.[1] Once he is given the meaning of a proposition, he ceases to concern himself with its history. Had it been turned out by a rationalizing machine rather than by a mind, the fact would be immaterial to him. Again, he is not con-

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[1] Psychology, says Mr. J. N. Keynes, deals with reasoning processes in the sense of observed uniformities, and investigates their genesis. Logic deals with them purely as regulative and authoritative. It is 'concerned with reasonings only in respect of their cogency; and with the dependence of one judgment upon another only in so far as it is a dependence in respect of proof' (*Studies and Exercises in Formal Logic*, p. 5).

cerned directly with the elements of feeling and belief and (as Descartes shows) of will which enter into all judgement.

§ 26. Logic deals with thoughts as justified, as rationalized. All thinking the consecution of which is shown as obeying Reason—thought explicating itself as rationally inevitable—is thereby justified. Every judgement must have a ground. The attribution of a characteristic to an object cannot be supposed unmediated, reasonless. It was arrived at somehow. In other words, it is an interpretation. We view every fact in the light of a theory. I may be unwilling or unable—like him who did not love Dr. Fell [1]—to say what the ground or justification of my judgement is. But until the reason is assigned Logic cannot test it. And the assigning it turns the judgement into a syllogism.[2]

§ 27. To say that a judgement must have a ground is only to say that it results from finding that some circumstance which

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[1] Brown was bidden by Dean Fell, under pain of expulsion, to translate straight off Martial's epigram :—

> Non amo te, Sabidi, nec possum dicere quare.
> Hoc tantum possum dicere, non amo te.

Compare—

> 'Hunccine amas ?' Equidem. 'Quare ?' Quia talis habetur.
> 'Inspice'. Quid prodest ? Intima causa latet. (Alexius.)

[2] 'In every judgment more or less of criticism is entangled, such criticism being the element in every judgment which makes it a reasoned judgment, as contrasted with what an unreasoned judgment would be if such a thing could be found' (Sidgwick, *Use of Words in Reasoning*, p. 362). Ultimately, no doubt, we are driven back to facts of immediate perception. But perception is not yet judgement. Judgement begins when interpretation begins. Facts cannot be inconsistent, but only theories. *No formed judgement, no proposition framed in language, can be a bare statement of fact.* A painter cannot 'paint what he sees' till he knows what it is he sees. Even a judgement of identification refers an object to some category already possessed by the mind. And statements about our perceptions themselves are descriptive and interpretative, and, therefore, liable to be mistaken. If I did not know it to be otherwise, I could sometimes of a bright, windy night find it almost impossible not to think that the moon ˙was racing through the fleecy scud. There can be no ἐπιστήμη of ἄμεσα, only νοῦς. Take these two sets of statements—' This object is a revolver; it is six-chambered; two of the chambers are empty; it is rusty; it was made by [maker's name]'; and, 'This pistol is an ingenious weapon; two shots have been fired from it; it has been a long time in the water; it has not been cleaned; it is of an old-fashioned make.' The latter set of assertions is highly interpretative compared with the former. Yet neither is really intuitional. In fact, an intuitional statement is impossible.

we know about a subject (about all S's or some S's) invariably carries with it the characteristic P, is found in P things only, though not necessarily in all P things. This circumstance is the middle term, the ground of attributing P to S. I say that Dick is a bad boy, because he breaks windows, or does something else which I consider only bad boys do—though some bad boys, it may be, show their badness in other ways.

§ 28. The allegation of the ground of a judgement, then, necessarily takes the form of two other judgements, one of which contains the subject and the other the predicate of the original proposition, while a third term is common to both, the relation of this middle term to the other two being regulated by rational laws which Logic investigates. 'A syllogism used for proof,' says Sidgwick, 'is a judgment (the conclusion) expanded so that the two disputable elements in it shall lie open to inspection.'[1] The inward connexion of the thought is made explicit. On the other hand, in assigning a reason for a judgement, we frequently state one premiss only, leaving the other to be understood. E. g.—'There is mercy with Thee; therefore shalt Thou be feared'; 'Lightly tread; 'tis hallowed ground'; 'Eo immitior erat quia toleraverat'; 'Beati mundo corde, quoniam ipsi Deum videbunt'; or Cade's, 'Away with him; he speaks Latin.'

§ 29. Or, to view the matter from the other end, if two thoughts meet in a middle term in certain ways, Reason impels the thinking activity along a determined groove and compels it to draw a conclusion. Should the mind by a confusion of ideas attempt to travel down a wrong groove, Logic points out that there is no rational sequence of thought, that the conclusion 'does not follow'. It may even have to turn the mind out of the attempted inference as being incompatible with the premisses.

§ 30. Logic combats not falsity but fallacy. Demonstration requires an ultimate postulate both of Matter and of Form—a criterion of the truth of the *data*, and a criterion of the validity of the reasoning. But Logic is concerned with the latter only. It does not ask whether a statement is true, but how it is justified formally. It does not require, then, to know the content of terms, but only their formal inter-relation.[2] Logic is a

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[1] Op. cit. 82.

[2] If the content of the terms remains abstract and blank, the syllogism

kind of consulting physician or confessor. 'Why,' it asks, 'do you say that whales are not fishes? But, after all, you need not specify your reason. It will be enough to say by what rational process you arrive at that conclusion.' *Answer.*— 'Whales are not fishes because they are something which no fish is '—the unexpressed something being 'viviparous'. Or all three terms may be left blank. *Inquirer.*—'Something I am thinking of must have a certain characteristic because it belongs to a general class of things which I know has that characteristic. Is this good reasoning?' Logic signifies assent. Again, 'This is that, and that is not the other. Pray, what am I to conclude?' 'That this is not the other.' Again, '*M*'s are always *P*, but *S*'s are never *M*. Can I infer that *S*'s are never *P*?' 'No, certainly not.'

§ 31. If the following reasonings were put before the plain man—

- (*a*) Soldiers wear uniform. Sailors are not soldiers. Therefore sailors do not wear uniform.
- (*b*) Swans are birds. Horses are not swans. Therefore horses are not birds.
- (*c*) Slaves belong to a master. Freemen are not slaves. Therefore no freeman belongs to a master—

he might not improbably say that any one can see through (*a*), that (*b*) is a good argument, and that in (*c*) each of the three propositions is a truism. Yet (*a*), (*b*), and (*c*) are similar in form and all alike bad reasoning. The conclusion of (*a*) is false as a conclusion (διότι) and false as a proposition (ὅτι). The conclusions of (*b*) and (*c*) are true as propositions but false (i. e. without justification) as conclusions. The premisses in every case are true. In the syllogism, 'Pat is Irish because he is a Frenchman and all Frenchmen are Irish,' the conclusion is correctly drawn and true in itself, though both premisses be absurdly false.[1]

which combines them is also a skeleton construction. If the terms are clothed with circumstance, the syllogistic framework is so also; but the force of the reasoning depends not on the material connexions of the varying contents, but on the inward and rational connexion of the judged relations of the terms, considered formally.

[1] That such elementary lessons in logic are not unnecessary is clear when a serious-minded paper like the *Spectator* lays it down (Feb. 18, 1899, p. 225) that, 'Though a man may sometimes jump to a right conclusion and illogically reach firm ground, he can never by the logical

§ 32. The reasons for an assertion may be, like Falstaff's, as plenty as blackberries. But what the logician is alone concerned with is the limited variety of ways in which the ground of a conclusion can be formally exhibited. Thus—Why do you say that S is sometimes P? I say it because—

(1) S has been known occasionally to be M and M's are always P (*Darii*). Or because,

(2) M's are always both S and P (*Darapti*). Or because,

(3) M's are always S and are sometimes P (*Disamis*). Or because,

(4) M's are always P and are sometimes S (*Datisi*). Or because,

(5) Every P is M and M's are always S (*Bramantip*). Or because,

(6) Some P's are M and M's are always S (*Dimaris*).

Again. Why do you say that no S is P? I say it because—

(1) S is always M, and M is never P (*Celarent*). Or because,

(2) P is never M, while S is always M (*Cesare*). Or because,

(3) S is never M, while P is always M (*Camestres*). Or because,

(4) P is always M, and M is never S (*Camenes*).

Only one kind of reason can be given for the assertion that S is always P. But that S is not always P could be shown in eight different ways.

If other modes of arriving at a conclusion were proposed they would be invalid. It is the task of Logic to sort out the valid from the invalid forms of reasoning, enabling us to distinguish consequence from inconsequence. It has nothing to do with the worth of the premisses so long as they are premisses. But directly we turn our attention to them in themselves, and regard them not as *data* but as *iudicata*, they too must show their rational anatomy, the plan of their reasoned construction.

§ 33. The most amusing sophisms are those which audaciously

process get a right conclusion from incorrect premisses.' It is really safer to have both premisses wrong than one only. Whately gives, as examples of a true conclusion being reached illogically from true premisses, the following :—

Every rational agent is accountable. Brutes are not rational agents. Therefore they are not accountable.

All wise legislators suit their laws to the genius of their nation. Solon did this. Therefore he was a wise legislator.

elude dissection, while pretending to offer a plausible reason; as when Lamb excused his coming so often late to the office by saying that any rate he always left it early; or as when the husband claims to be economical by making one slice of bread do for both butter and jam.   Sometimes the ground alleged is a mere play upon words, equivoque, or even pun.   George Selwyn, speaking of Sir Thomas Rumbold, M.P., who had begun life as a drawer at White's and was ending it as nabob and millionaire, observed that everything comes to him who knows how to wait.   Successful equivocation among childlike nations, with a great idea of the mysterious sanctity of words,[1] is held to bind the person deceived; as when Lycurgus bound the men of Sparta to observe his laws until his return, and never returned.

§ 34. The implied ground of a judgement may be so ludicrously inadequate that the jest would be gone if the argument were displayed in full.   The Gloucestershire song, *George Ridler's Oven*, tells us that 'Gaarge he wur the oldest brother, And therevoore he would zing the beass'.   When gas took the place of sperm oil as an illuminant, a benevolent lady asked, What will become of the poor whales?   The reasoning implies such confusion of thought that the help of Logic for its exposure hardly seems worth invoking.   And yet if fox-hunting were to go out, and some one were to ask, What will become of the poor foxes ? the question would be a very pertinent one; for if foxes were not artificially preserved for the chase they would soon be exterminated.

§ 35. Reasoning, we have seen, is thought justifying itself formally.   It is the educing of a judgement from two antecedently formed or given judgements.   The ratiocinative act, then, has to do directly with judgement, and only indirectly with conception. The terms of a syllogism may be left blank, but the outlined judgements of which it is composed must be stated.   Conversely, every conclusion is a judgement.   Judgement is ' a consciousness concerning the objective validity of a subjective combination of ideas ' (*Ueberweg*).   It may therefore be mistaken, and so requires proof.   A concept, on the other hand, does not admit of error, until it is asserted of a subject.   When we speak of a 'true idea'

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[1] St. Augustine defines falsehood as 'an unnatural use of words, contrary to their final causes '.

we mean that it is true in this or that predication. It cannot, therefore, be called upon for its ground. Not being propounded as either true or false, it needs no justification. If it is (psychically) possible it is possible, and there is an end of the matter. 'Truth', says Dr. Bradley, 'is not found except in judgements.' There is no Why? to be asked for the notion 'an unlawful desire', but only for the same notion developed as a proposition—'Some desires are unlawful.' Nor can a notion stand as premiss. If we see a picture we do not inquire, What then?

§ 36. It is true that a concept is often complex, and indeed all except the primary notions—and can these be called notions?—are really so. No object can have one attribute only unqualified by any other. Now the determining element in a concept, that which specifies it in the larger class to which it belongs, may be replaced by a relative clause, containing a dependent judgement. A broken vase is a vase which is broken. A three-legged stool is a stool which has legs which are in number three. A horse is an animal which is equine. Nevertheless such a dependent judgement asserts nothing categorically. It therefore needs no justification. It is ideal only.

Accordingly the consideration of the Concept only enters into Logic as enabling us to analyse the import of the Proposition.

§ 37. But the reader is perhaps impatient to object to what is said above as follows:—Rational consequence in Thought, if that be the right definition of the province of Logic, need not always imply mediation, the alleging of a ground for a statement. Is there not such a thing, he will ask, as *immediate consequence*? In certain propositions, such as truistic and also analytical propositions, the subject involves and necessitates the predicate. And even in concepts one element of the compound may carry another element with it by rational implication. Contrariwise, a concept may contain formally incompatible elements, and a judgement may be a contradiction in terms. In such cases there is surely no need of middle terms. The concept or judgement is self-justifying or self-condemning.

§ 38. A closer consideration will, however, show that there cannot be such a thing as immediate inference, or consequence, in thought. Consistency, as contrasted with bare repetition, is never simple, but always complex.

§ 39. Both concepts and judgements, it is true, frequently exhibit marks of internal implication. E. g.—'a man and (therefore) a brother'; 'the safest because the boldest plan'. The former is *explicatio notionis*; the latter *explicatio rei*. 'A new Church and therefore no Church' (*Theophilus Anglicanus*) is probably the former. In other words 'therefore' and 'because' point to general knowledge, to a major premiss, which is in the background. A man and (since the notion of man includes brotherhood) a brother. The safest plan because (boldest plans being safest) the boldest. It is obvious that *safest* cannot be be got straight out of *boldest*. If this is less obvious in the case of *brother* and *man*, let it be considered that the entire content of the notion 'man' is not to be assumed as conveyed by the name 'man', which is all that, logically, we are given to start with. If the content of 'man' is given, such *datum* is something extraneous to the concept considered objectively. Again, 'a selfish, and so an unlawful, desire' means 'a selfish (which is necessarily an unlawful) desire'—the parenthetic assertion standing outside the concept, in apposition to one of its elements. The Almighty is 'patiens quia aeternus'. Wesley speaks of the Choctaws as 'the least polished, that is the least corrupted, of the Indian nations'.

§ 40. Another class of obviously complex notions contains an *adversative* particle. 'Black but comely.' 'Slow but sure.' 'Advocatus et non latro.' Johnson said of Somerville that he wrote very well for a gentleman. Here, again, a general proposition is suggested. Advocates are (usually) robbers. Gentlemen do not (usually) write well. It is only by virtue of such general maxim that the notion has a rational character. This is the true significance of the legal aphorism, *Exceptio probat regulam.* Other illustrations are—'A maiden of our century, yet most meek.' 'Poor (or rich), but honest.' 'Dura lex, sed lex.'

§ 41. A mark of internal implication is also found in propositions. E. g.—'A quadrangle has necessarily four corners'; 'A native oyster cannot have been imported'; 'Vertebrate creatures must needs have backbones'; 'To sail quite round a peninsula is clearly out of the question.' In such judgements there is *explicatio notionis.* But the internal mark of illation may be found in purely synthetic propositions; e. g. 'A bishop nowadays is necessarily a man with private means.'

§ 42. The following may be given as illustrations of adversative propositions—'Fiat iustitia, ruat caelum'. 'Though He slay me, yet will I trust in Him'. 'Naturam expellas furca tamen usque recurret'. 'Timeo Danaos et dona ferentes'. 'A vagabond is not for that reason necessarily a rogue'. 'Ut desint vires, tamen est laudanda voluntas'. 'Ne sit summum malum dolor, malum certe est'. The Greek μὲν . . . δέ breaks up the antithesis into two parallel assertions. Contrast, 'England, with all thy faults, I love thee still.'

§ 43. This subject will be treated of more fully under Analytical Judgement (§ 507 seq.).

§ 44. Next, let us take the case of concepts and propositions in which, though there is no mark of internal implication, the elements seem obviously to imply and involve one another, either notionally or etymologically, or even verbally. Instances are such as :—

Stuck adhesive and suspended hung.

A pacific eirenicon making for peace.

A peculiar property.

A wedded wife.

Four square.

An unlucky mischance.

Semibovemque virum semivirumque bovem (Ovid).

The foolishness of fools is folly.

Costard says, 'We know what we know,' and Joe Gargery in *Great Expectations* assures Pip, 'Manners is manners, but your 'ealth's your 'ealth.' Sarah Battle deemed cards to be cards, desiring therefore the rigour of the game. When the butler at Queen's Crawley announced *mouton aux navets* and *potage de mouton à l'écossaise*, Sir Pitt Crawley observed with satisfaction that mutton is mutton, and an uncommonly good thing too—or words to that effect. We say, 'Che sarà sarà,' and 'Let bygones be bygones,' or 'We shall see what we shall see'.

§ 45. It is clear, however, that we cannot get from 'stuck' to 'adhesive' or from 'peculiar' to 'property' by a formal process of pure reason, without some additional explanation or some knowledge of the *matter*, though the matter be the content of a notion, or the meaning of a word, and not the properties of a thing. Even where, as in the above propositions, there is an actual verbal tautology, the word in the predicate has

not precisely the same force as it has in the subject.   The subject is more denominative and the predicate more intensive —drawing attention to what might otherwise escape notice in the characteristics which the name implies.

§ 46. In fact, every proposition has some ampliative signifi-cance, otherwise it would not be worth making—would not be, indeed, a proposition.   'It is ultimately one,' remarks Dr. Bosanquet, 'to say that *I judge* and that *the real world for me, my real world, extends itself.*'[1]   '*A* is *A*' is not a judgement at all unless there be some real movement and advance of thought, some clearer knowledge gained by myself or imparted to another.   Even a platitude is an extension of thought ; and moreover we often, out of a kind of moderation, couch assertions in a purposely platitudinous form, especially by the use of 'too'—e. g. 'We ought not to attempt too much.'

§ 47. Similarly, in the case of concepts, pleonasm is never mere repetition, but either force is sought to be gained by synonym—as, 'a poor unfortunate,' 'delightful and charming,' 'miserly skinflint'—, or the redundancy is humorous—as in Artemus Ward's 'female woman'—, or is due to ignorance or local idiom—a Scotch guide-book before me speaks of the 'Episcopal bishop' (i. e. Episcopalian)— ; or to a change in the meaning of words—as, when we say 'cloth clothes', for we also speak of linen clothes, and of a fair linen cloth.

§ 48. A real internal *confliction* of elements in concept or judgement is equally impossible.   We can frame with lips or pen a contradiction in terms—'bonâ fide imposture,' 'four-footed biped,' 'most tolerable and not to be endured,' 'your full cup is almost empty,' or the like—but nothing here has been conceived or judged by the mind.   No doubt, we are familiar with expressions in which there is apparently a self-contradiction, either verbal, as Iago's 'I am not that I am', πόλις ἄπολις, faultily faultless, 'he is all fault that hath no fault at all,' or in sense, as, 'when I am weak then I am strong,' 'plus ça change plus c'est la même chose,' 'bourgeois gentilhomme,' 'black rubric,' 'red albe.'   One of Beaumont and Fletcher's plays is entitled, 'A king and no king.'   But in such cases we have, not any real incompatibility of ideas, but rhetorical,

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[1] *Logic*, i. 4.

poetical, epigrammatic, or humorous trope.   This will be further illustrated below (§§ 133, 235 seq.).

§ 49. An internal necessitation or confliction of ideas must be *given*, then, by means of a middle term.   If it is objected that whoever judges must be supposed to know what his ideas contain, we reply that the content must be *realized* by prior reflexion before judgement can take place ; and though to the speaker his own proposition may be a matter of course, it is not so to the hearer, otherwise it would not be made.

§ 50. The Aristotelian Logic is often disparaged as merely formal.   But, in truth, neither in the hands of its founder nor in that of his exponents, whether Peripatetic, Arabian or Scholastic, was it formal enough, being blended with natural philosophy, transcendental metaphysics, and divinity.   The dovetailing of Logic into demonstration from self-evident axioms or irreformable dogmas of faith was especially the aim of the mediaeval schoolmen.   A system of Logic cannot, it is true, be constructed which shall be compatible with all opposing metaphysical doctrines ; for an extreme nominalism or atomism strikes at the root of conception, of judgement, and of truth itself.   Logic is unable to show how ideas may be formed so as always to agree with facts, but it guarantees that, if a thought is *true*, the facts shall be found to correspond—which is what is meant by truth.   But, beyond postulating the existence and laws of truth, the logician is not concerned with ontological inquiries.   His science, while it demands universals, can only help in a negative and merely regulative way towards their formation ; nor can it distinguish cause and effect from any other unexpressed relation between the subject and predicate of a general proposition.   To it the propositions, 'Cold winds come from snowy regions,' 'Cold winds dry the ground,' and 'Cold winds are unpleasant,' are the same in form, though to the metaphysician the first expresses a cause, the second an effect, and the third the inherence of a quality.   ' It is slippery because it has frozen ' and ' It has frozen, because it is slippery ' are similar propositions for the logician's purpose ; though to Thought the one is *ratio essendi*, the other *ratio cognoscendi*. The subordination of ascending and descending classes, which for the physical philosopher is a scheme of species and genera,

and for the ontologist the reconciliation of Being and Becoming, is for our purpose a relation merely of larger or narrower extension and intension.

§ 51. Easier than the detachment of Logic from metaphysical and psychological problems should be its liberation from a supposed allegiance to the sciences as their Organon. For by the view of Formal Logic as an introduction or propaedeutic to the Logic of ' fruit ', by the view which regards Syllogism as the Law and Inductive investigation as the Gospel, a line of partition is drawn between Deductive and Inductive Logic, which may even form separate volumes.[1] The comparative utility of these two subjects of study need not here be discussed. They are essentially different, and no clear conception of Logic will embrace them both. They are not two wings of the same building ; still less is ' Formal Logic ' the antechamber by which we enter the spacious halls of Experimental inquiry ; but it is as though to a symmetrical and self-contained Doric temple we built on a vast modern factory or railway station.

§ 52. Baconianism did not give men an enlarged and reformed Logic, but rather induced them to turn their backs on Logic as useless for the enrichment of human knowledge or the improvement of the human lot. Whether *scimus ut sciamus* or *scimus ut operemur*, in either case *melius est naturam secare quam abstrahere*. Logic offers no extension of man's empire over the universe. The system which Bacon proposed to substitute for the *tenui deducta mathemata filo* of the schoolmen—who, however, must be given the credit of having on certain subjects spoken almost the final word—is weak and halting. It is really his superficial comparisons of instances which is unequal to the subtilty of nature. Laws do not leap to the comparing eye in the easy way Bacon imagined. It is not by his rules that the great

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[1] Grote observes, however, that whereas formerly the two streams—the ' Inductive and Ratiocinative halves of Logic '—' flowed altogether apart in our minds, like two parallel lines never joining nor approaching. . . . Mr. Mill has performed the difficult task of overcoming the inveterate repugnance between them, so as to combine the two into one homogeneous compound' (Review of J. S. Mill on Hamilton's Philosophy, *Westminster Review*, 1866). None the less, what Mill has to say about formal logic is distinct from what he has to say about Induction ; whereas logic is at every step liable to become entangled with questions of metaphysics or of psychology.

conquests of modern science have been achieved.[1]   There must
be ' anticipations '—not the barren theorizing of the *intellectus
sibi permissus*, but great and fruitful hypotheses.[2]   On the other
hand, he convincingly showed that knowledge cannot advance
a step without materials furnished by the outer or inner experi-
ence.   But Logic stands apart from Experience, whether inner
or outer.   It is equally indifferent to the existence or non-
existence of ' innate ideas '.   The properties of a triangle are
not more logical than the properties of salt or sugar, nor the
laws of beauty and goodness than the law of gravitation.

§ 53. In Induction there is, no doubt, a formal element of
rational necessitation, which it is the work of ' Inductive Logic '
to abstract from the matter given in experience.   It will be
found, however, that the universal, validity-bestowing principle
in all proof is the same, whether we are proving deductively or
inductively.   Not only must we say with Mill that ' all reasoning
is resolvable into syllogisms ', but with Hegel that everything
rational is essentially syllogistic. .

§ 54. Inductive Logic is merely the regular logic applied in
a particular way.   Postulating as a vast major premiss the
axioma generalissimum that Causes, uncounteracted, are always
followed by their Effects, it subsumes under it a number of
suggested explanations of a phenomenon, with a view to testing
them and excluding all except the right one.   If this or that

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[1] ' No amount of observation could detect any resemblance between the
bursting of a thunderstorm and the attraction of a loadstone, or between
the burning of charcoal and the rusting of a nail ' (A. W. Benn, *Greek
Philosophers*, i. 151).

[2] ' Modern science has substituted for the wings of Icarus a pair
of crutches, bearing the names of Observation and Induction, with
which, no doubt, she advances more securely.   Nevertheless, science
would be wrong in attributing all her progress to method.   Besides
the two instruments that we have named resides a free force, a sponta-
neous element of the human mind ' (Vinet, *Metaphysics*).   Bacon, says
Dean Church, 'was so afraid of assumptions and "anticipations" and
prejudices, that he missed the true place of the rational and formative
element in his account of Induction.'   His system was, therefore, ' as
barren of results as those deductive philosophies on which he lavished his
scorn ' (*Bacon*, p. 245).   ' The verification of a great hypothesis is a kind
of questioning and cross-questioning of Nature.   Her awful silence in the
presence of the unperceiving gives way before those who know how to
put the questions ' (Wilfrid Ward, *Problems and Persons*, p. 141).

circumstance is not always followed by the effect under considera-
tion, it cannot be the required cause. The minor premisses in
this kind of reasoning are furnished by experience; and the
combination of experience with the above-mentioned axiom is
what enlarges our previous knowledge of the laws of things.
Mill tells us that he long puzzled himself 'with the great paradox
of the discovery of new truths by general reasoning. . . . How
a conclusion, being contained or implied in the premisses, could
be a new truth was a difficulty which no one, I thought, had
sufficiently felt, and which at all events no one had succeeded
in clearing up'.[1]   But is it not plain that the newness of the
truth arises either out of the novelty of the experience, or from
old experience being viewed in a new light?

§ 55. What is important, then, for induction is not reason
(*raisonnement*) but knowledge and judgement. The logical
analysis of the inductive process is of great interest. But the
Five Methods are employed at every moment by every man,
woman and child. Had they remained unformulated, the advance
of the sciences would not have been retarded in the smallest
degree.[2]   That advance must be ascribed to the wiser direction
of the thinking subject, the judicious employment of the trained
understanding upon the materials accumulated by observation
and experiment. The natural philosopher is more concerned
to ask what analogies are on all fours than, with the logician, to
inquire in the abstract why parity of reasoning rightly carries
conviction to the mind.

§ 56. A 'general theory of the right relations of all thought
to its matter', a 'reasoned theory of the rules which should
govern the search for objective truth',[3] a 'scientia dirigendi
facultatem cognoscitivam in cognoscenda veritate',[4] may be
much superior to Logic, to 'the faded dialectic of the schools';
but it is not Logic. Inductive science furnishes rules for dis-
tinguishing relevant from irrelevant grounds of inference. The
trained experience of a detective, for instance, seizes on the
important, and dismisses the unessential, features of a case.

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[1] *Autobiography*, p. 180.

[2] Mathematics, on the other hand, are studied both for their own sakes
and as a potent organon in the development of complex sciences such as
physics, chemistry and astronomy.

[3] Mill, *On Hamilton*, p. 477.   [4] Occam.

But the laying bare by Logic of the inward principle of illative cogency will be of little assistance for guiding the judgement to discriminate aright.

§ 57. And yet one writer after another has confused counsel proffered to the intelligence for judicious grouping of the contingent properties of things with dissection of the fundamental law of universal Reason.[1]   Lewes, for instance, defines Logic as the 'science of philosophical tools', 'the codification of the rules of proof which the various sciences have employed and must employ'.[2]   But why 'must'?   It is this absolutely valid and compulsive principle of which the logician is in search; and no examination of the ἴδιαι ἄρχαι of the various sciences will give it, though we may thus obtain a 'theory of the general element in science'.   The art of arranging, systematizing, and correctly interpreting the *data* of experience is distinct from an endeavour to think out the nature of logical obligation; the search for objective laws is distinct from the analysis of the *lex legum*, on which the existence of law depends.   The syllogism may conceivably be, as Condillac asserts, a schoolboy's pastime, *un amusement de collége*.   Mill's 'smaller logic' of 'mere consistency' has a restricted province compared with the wide field of that larger inquiry which embraces all the general conditions for the ascertainment of truth.   Its precepts may possibly have no other practical utility than as a handrail to keep men from tumbling into argumentative pitfalls.   But that is only to say that the law of Reason is simple and one, while the facts of the universe are a limitless ocean.   Truth is most nobly sought not

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[1] 'Logic,' say the Port Royalists, 'exists for the very purpose of being an instrument to the other sciences. . . . It is the art of directing the reason aright in obtaining the knowledge of things for the instruction both of ourselves and others.'   Descartes regards it as the practical regulation of thought's procedure—'methodus recte utendi ratione et veritatem in scientiis investigandi.'   Reid describes Syllogism as 'a mechanical mode of reasoning, by which in all cases truth and falsehood may be accurately distinguished'.   This is Abailard's 'veritatis seu falsitatis discretio'.   Mill defines Logic as 'the science which treats of the operations of the human understanding in the pursuit of truth'.   'Methodology,' writes Sigwart, 'should be regarded as the special, final and chief aim of our science.'   Yet he says a few pages earlier that 'Logic proposes to set forth those criteria of true thought which are due to the demand for necessity and universal validity'.

[2] *History of Philosophy*, ii. 731, 732.

for its utility but for itself.   Nor can it be to the advantage of scientific thought that, in deference to a spurious utilitarianism or to the claims of the transcendental, the logician should be persuaded by scorn, menace or cajolery to cease to be 'merely formal'.

§ 58. Logic is, in one sense, an exact science, more abstract, as Spencer remarks, even than mathematics, in that it deals with the qualitative relations of thoughts rather than with the quantitative relations between things ; so that it ought not to be possible to say of its study—

> I too in youth did eagerly frequent
> Doctor and saint, and heard great argument
> About it and about; but evermore
> Came out by the same door wherein I went.

No new discovery can add to or modify it, and its conclusions, as distinguished from its applications, are fixed and certain. Nevertheless, as it is brought into living relation with the actual variations of thought and language, the work of Logic is never done—perhaps is hardly yet begun—and in that sense it is a science capable of advance,[1] with countless knots to untie and difficulties to disentangle.

[1] I cannot, however, adopt Mr. Sidgwick's remark, that Logic, ever correcting laxities of rule or formula and earlier attempts to hide real difficulties under vague phrases, 'must always be to some extent at war with its own earlier stages' (*Use of Words in Reasoning*, p. 51).

CHAPTER III

THE ONE SOUGHT IN THE MANY

§ 59. He was the first logician who reflected first upon the rational connexion of his own and other men's thoughts, asking the meaning of such illative or adversative expressions as *For, But, Because, Although, Therefore, Accordingly, Nevertheless*. Language without marks of rational sequence would be little more than pantomime. Sooner or later, reasoning beings were sure to turn thought in upon its own connexions, to seek to read the title-deeds of inference, to ask, What right have I to conclude thus and thus? For what reason do I reason in this way?

§ 60. Mental science is unique in regarding the mind's operations from the inside, which is as though a clock were to explain and criticize its working. Other sciences, even the most abstract, as mathematics, are not investigated by the help of their own processes. Aquinas defines Logic, on the other hand, as Reason reasoning about reasoning, scrutinizing her own laws, seeking a *rationale* of her own activity. 'Ratio de suo actu ratiocinari potest, et haec est ars logica.' It would be more correct to say that Logic is the analysing of the reasoning process by the Understanding, the examination of ὀρθὸς λόγος by νοῦς. It is Thought thinking about the rational necessities by which it is governed. That which, in every branch of learning, finds the One in the Many, and abstracts the permanent, necessary and universal form from the contingent and variable matter, is not the Reason (in the sense, defended below, of the ratiocinating activity), but the Intelligence, apprehending ultimate principles and grouping detailed intuitional facts under a unity of idea. The Intelligence, in the rôle of logician, has first to establish the norm or abstract type of Reason in itself absolutely; secondly to analyse the contingent form or mould of human Thought, examining the diverse modes of expression in which the thoughts of minds constituted as ours are can be

cast; and thirdly to trace through this variety the laws according to which Thought's connexions are governed and directed by Reason.

§ 61. Introspective analysis, the reflexion by the Ego upon its own rational energies, was not Philosophy's eldest-born. The first pre-occupation of Aryan man's awakened thoughtfulness was physico-theological.[1] He sought some theory of the universe closing him in on every side. Plato says that philosophy began in an awed curiosity.[2] Is there a One in the Many? Had life a single origin? Is the world a chance clashing of brute and blind forces? Is it at the mercy of the capricious partialities of arbitrary and jealous deities, or is it controlled by some harmonizing unity, according to measure and number and weight?

§ 62. The Ionian thinkers answered this question in a naïve spirit of mystical materialism. They were unable to form a clear idea of the non-material; yet the primary Cause and Substance—water, air, fire—, whose modifications are the manifold of experience, was not conceived as wholly mechanical. As contrasted with the shifting plurality and seemingness of mere phenomena, the sovereign Law of unity tended to be thought as super-essential and self-existent. Yet for reality and truth the verity of the visible Many, disparaged by the Eleatics, is as necessary as the verity of the invisible One, which Heracleitus and the primitive nominalists denied. The Pythagoreans did something to reconcile multiplicity and unity, sense and reason, by means of Number, which pervades all things that appear. Empedocles, seeing clearly that a moving rather than a material First Cause must be looked for, accounted for the existing world, with all its pain and wrong, as brought about by the conflict of Love and Strife. Anaxagoras, rising above such semi-mythological explanations, ascribed the evolution of the universe to Intelligence, ordering all things by combination and division. The world is a κόσμος. The human is akin to the

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[1] Not that races in childhood's stage, any more than children themselves, have concrete minds. On the contrary their turn of thought, for want of experience, and want of disillusionment, is legal and abstract. But they do not make the operations of their own minds the object of self-conscious thought; and, even if they did, they are unable to give technical names to their abstractions.

[2] *Theaet.* 155 D. Cf. Ar. *Met.* i. 2, § 8.

eternal Reason, and mind is not a mere vital spark liable to be blown out by a puff.

§ 63. In presence of the cosmic immensities, primitive minds asked, 'What is Man?' He was not yet thought of as 'noble in reason, infinite in faculty, his doing and moving express and admirable, in action like an angel, in apprehension like a god'. He must leave, therefore, to the supernal powers the blissful cognizance of the inward law of the universe—'Canst thou by searching find out God?'—and, learning his limitations, seek to 'know himself'. Socrates gave the first great impulsion to mental and moral science. The contrast between Mind and Matter had been originally a theory to account for the distinction of subject and object. But later the mind was turned in upon itself. Was there *there* also a one and a many, in the microcosm of the soul as well as in the external world? What is the relation of sense perceptions to general notions, of particulars to universals? And especially in the sphere of conduct. Has that its underlying laws and unities? Early man is governed in his ideas of right behaviour by custom and tradition, and by the desire to please more or less capricious divinities. Justice is administered in accordance with case-law or the gnomic wisdom of sages. Among the Greeks law (νόμος), varying from state to state, and, in democracies, from year to year, was apt to seem a mere convention—what we have made we can unmake. Thucydides tells us, moreover, that the accepted standards of right and wrong were thrown into confusion during the Peloponnesian War, and that the Pest of 430 B.C. was followed by great corruption of morals. But such changes always attend upon multiplication of the arts and appliances of life and upon speculative activity, causing moralists to sigh for the simplicity of a golden age. A hedonistic scepticism makes individual man the measure of all things. Each one's perceptions hold good for himself only, and all opinions are alike true. Why should not the worse be made to appear the better reason when among reasons there is no such thing, really, as badness or goodness, and things are what we agree they are? The extreme subjectivity of Protagoras subverts morality. According to him all opinions are true, as, according to Gorgias, all are false. It comes to the same thing.[1]

[1] We are told of Numa Pompilius that he endeavoured to bind his

§ 64. If virtuous behaviour had only isolated ends and partial utilities to serve, with no universal Good behind, in whose nature all several goods participate ; if the passions, the impulses of the senses, were haphazard and casual, uncontrollable by any central principle of Reason ; if right had no measure but might, the interest of the stronger, the whim of a man-made deity, or a calculus of expediency : then, it soon became obvious, human society and civilization must quickly fall to pieces. The task of conservative thinkers was to show that morality does not live from hand to mouth, but rests upon general principles of right and wrong, applicable universally. It is not a fluctuating sea of confused opinions and incoherent, blind desires. Heaven is to be honoured ; but right-doing is not a matter simply of rewards and punishments, or of an exchange of good offices between gods and men.[1]

§ 65. The assertion of the reign of law in natural phenomena, followed by the exhibition of a universal element in conduct, involved the conceptual nature of Thought, and so pointed to the logical analysis of inference, which requires to be mediated by abstract or common notions. Without middle terms, knowledge is not scientific, but only a guess. And if it is to rest on any constant basis, the government of the particular by the universal must be guaranteed. Whatever is true of the general must be

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Romans together in social and commercial intercourse by establishing the worship of Good Faith. But it was open to any one to ask why Good Faith should be worshipped. With something of the same *petitio principii* Shaftesbury bases the duty of honesty on an implied contract. I am bound to keep my word because I have given my word to keep it.

[1] To systematize conduct and place it on a philosophic and abstract footing was the especial Aryan contribution to the science of life. The Semitic genius, always ethical and religious, concerned itself with Personality and Will, which endeavours to realize itself in individual actions. For to Will the actual and concrete is not mere seeming, but is significant and of high value. The entrance of the Eternal into history, into spatial and temporal limitation, gives a permanent importance to the details of behaviour and observance, making the terrene *here* and *now* the symbol and pledge, the sacramental vehicle and veil, of what is celestial. The logical Hellenic and Indian mind, on the other hand, found its interest in Thought rather than in Conscience, seeking a basis for morals in general ethical principles rather than in personal union with, and devotion towards, God.

true of the individuals which are subsumed under it, that is, to which the general or common name is applicable.

§ 66. The process of concluding from one particular to another through a general conception would be likely next to attract attention for its own sake. Yet Logic as a science was not born of pure reflexion or intellectual curiosity, but rather of the practical necessities of arguing. Greek philosophy was naturally disputatious, the thrust and riposte· of open-air discussion. It was nursed in the schools, in lecture or debating hall, in agora, garden, grove, walk and portico, rather than in cell or study or on the lonely hill-side. The Greeks, who had few books, communicated opinion by word of mouth. In the game of intellectual athletics, where victory was sought even more than truth, the philosopher never forgot his antagonist. He was either questioner or respondent, and was in little danger of not knowing what was to be said on the other side of any question. He was, moreover, posed and troubled by tricks and subtilties of language which a reasoner less bound to reduce an opponent to silence—*subiugare assensum*—would break through like gossamer.

§ 67. Of course, τὸ διαλέγεσθαι, dialectic—a word used, however, in several senses—, Plato's τὸ διδόναι καὶ δέχεσθαι λόγον, does not require two persons. But the discussions which a man holds with himself in the forum of his own mind would hardly have awoke inquiry into the formal validity of the reasoning employed. They are seldom put into words ; and, besides, no one has an interest in accusing himself of sophistry. On the other hand, the necessities of Greek life called for mastery over argument and confutation. Men had to elaborate the art of persuasion and counter-persuasion, to search the weak spots in an opponent's harness, to secure the weak places in their own. It would be a bracing discipline for modern thinkers to have to defend their theses publicly, scholastic fashion, in mood and figure, against quick-witted disputants, or to state every position formally, as St. Thomas does in the *Summa*, with a *Sed contra* after it, followed by a *Respondeo*.[1]

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[1] At the Savoy Conference in 1661, the disputation was one day conducted syllogistically, the Church side positing the universal negative, that nothing in the Prayer Book is contrary to God's Word, and the Puritans instancing various particulars in which such contrariety existed.

§ 68. It so came about that the dialectical machinery whereby arguments were established called for analysis. But first, why should a disputant be held, against his will, to an admission made by him? By evasive quibbling and cavillation it seemed that any one might slip out of anything. What was the force, an Eristic might ask, of the *reductio ad absurdum*, and of Socrates' favourite method of leading an opponent on to unpalatable consequences of his original contention? If to hold an opinion is to be tied to hold all that that opinion involves, where is the unifying law, or principle of rationality, which thus necessitates inference? It had to be shown that the manifold of presented facts admits of abstraction; that general notions are possible; and, on the other hand, that rules hold good of cases.

§ 69. Thus from the subordination of concepts we obtain Syllogism, read backwards and forwards—Induction and Deduction. Aristotle observes that Socrates introduced the construction of definitions into philosophy;[1] for true knowledge is of universals, and to know a thing is to have discovered its essential constitution, the true way to conceive it, and not merely some quality with which the observer happens to be impressed. Plato,

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Aubrey writes of the generation before—'Dr. Chillingworth did walk much in the College [Trinity] grove, and there contemplate, and meet with some cod's head or other, and dispute with him and baffle him. He would alwayes be disputing; so would my tutor. I think it was an epidemick evill of that time, which I thinke now is growne out of fashion, as unmannerly and boyish' (*Brief Lives*). It was possible in that age for disputants actually to exchange sides in all conviction; as John and William Rainolds converted one another. One brother had been a Papist, the other a Presbyterian.

[1] Definition, bringing order out of the chaos of unrelated impressions, is especially needed in ethical and political discussion. 'It is true,' says Mr. A. W. Benn (*The Greek Philosophers*, i. 143), 'that definitions are also employed in the mathematical and physical sciences, but there they are accompanied by illustrations borrowed from sensible experience, and would be unintelligible without them. Hence it has been possible for those branches of knowledge to make enormous progress, while the elementary notions on which they rest have not yet been satisfactorily analysed. The case is entirely altered when mental dispositions have to be taken into account. Here abstract terms play much the same part as sensible intuitions elsewhere in steadying our conceptions; but . . . the experiences from which those conceptions are derived are exceedingly complex, and exceedingly liable to disturbance from unforeseen circumstances.'

dissatisfied with the Socratic method of sifting vulgar opinions, obtained his lower generalizations deductively from the most general notions.

§ 70. But it remained for Aristotle himself to think out the theory of deductive Inference and to build up, from base to battlement, a complete and rounded system of Ratiocination. The Platonic Socrates had given a stimulus and impulse to logical speculation. But his cross-examining Elenchus savoured too much of the Athenian law-courts to give birth to an abstract *rationale* of reasoning. His erotetic method[1] was not that of a student, nor even of a lecturer announcing his conclusions from pulpit or platform. The late Professor Jowett is said to have remarked that Logic is not a science nor an art, but a dodge; and there was a good deal of artfulness in the Socratic disputation; but it was that of the family physician entrapping Jacky into swallowing a bolus. Logic as a science required to be excogitated more *in vacuo* and with less didactic aim. Popular institutions are not favourable to pure thought. But, with the decline of political and forensic activity, abstract speculation found space and leisure to expand. Aristotle established the theory of reasoning upon an inexpugnable and eternal basis, though neither he nor his later exponents kept Logic entirely clear of intrusive metaphysics and natural philosophy.

§ 71. In the same way that there is a science of Being as Being,[2] abstractedly from this, that and the other thing, viz.

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[1] The Socratic method of extracting from an interlocutor some opinion the drift of which was not at once obvious, and then of working from point to point until the view elicited was seen to evolve in principle some unexpected consequence or contradiction between theory and practice, is much the method which Newman describes himself in the second chapter of the *Apologia* as having adopted in the early days of the Oxford Movement. 'I walked with men step by step as far as they would go. . . . I tried to make them preach the truth without knowing it. . . . I was not distressed at the wonder or anger of dull or self-conceited men at propositions which they did not understand. . . . I was not unwilling to draw an opponent on, step by step, by virtue of his own opinions, to the brink of some intellectual absurdity, and to leave him to get back as he could. I was not unwilling to play with a man who asked me impertinent questions. . . . Also I used irony in conversation, when matter-of-fact men would not see what I meant.'

[2] The phrase τὸ ὂν ᾗ ὄν, however, does not mean τὸ ὂν χωρὶς τῶν ὄντων,

Ontology; of Number as Number, abstractedly from the nature of the objects numbered, viz. Arithmetic; of abstract Geometrical Figure; of abstract Grammatical Syntax; and so forth; so there must be an important place in philosophy for a *rationale* of Reason as Reason, abstractedly from the content of the terms. This should be called, perhaps, Logology. The Post-Aristotelians called it λογική (ἐπιστήμη, τέχνη, or πραγματεία). In Aristotle himself the adverb λογικῶς is contrasted with φυσικῶς, in the sense of 'dialectically'. The adjective λογικόν likewise. The Father of Logic nowhere calls the science directly by that name.

§ 72. The study of the laws, or law, of Reasoning is not contrasted with physical inquiry as the science of the phenomena of Mind contrasted with the science of the phenomena of Matter. We have nothing to do in Logic with phenomena. If pure thinking, apart from experience, could teach us a concrete fact, this mental or spiritual addition to our stock of knowledge would be, in the view of the logician, as extra-logical as information about a phenomenon which can be handled, smelled and tasted. And, certain conclusions of psychology once given us as *data*, chiefly as regards the conceptual structure of thought, we have no more concern with psychology than geology.

§ 73. Reason, no doubt, is apprehended by the mind, as light by the eye, and becomes reasoning by passing through mental moulds. But the validity of any reasoning is tested by an objective standard of correctness, and is dissected as a formal product, not in relation to the individual intelligence from which it issued, except that the intended meaning of the words must be supposed ascertained. The natural laws of Knowledge are determined by the mechanism of our faculties and psychic constitution. The normal and regulative laws are prescribed from without, by an absolute principle of Reason. Psychology shows in what way rational beings, constituted to correspond consciously with Reason, differ from non-rational.

§ 74. Yet the law of subject and the law of object are not the same thing. An argument is *in itself* good or bad, right or wrong, correct or fallacious. Such expressions imply an ideal law or pattern. Our reason is not a special paramount faculty, nor yet τὸ ὂν ἀφαιρουμένων τῶν ὄντων, but rather τὸ ὂν (οὐχ ὡς ὕπαρχον ἀλλ') ᾗ ὄν.

but is simply our energizing as rational creatures.[1] Our thinking, as a cerebral activity, is compelled, while the objective *nexus* of thought is necessitated, by *the reason of the thing*. We recognize a universal rightness in the matter, an *ought* as well as a *must*. Otherwise there is no truth. What this objective standard is we now proceed to inquire.

[1] Milton, however, makes Reason the sovereign faculty :—

> In the soul
> Are many lesser faculties that serve
> Reason as chief. (*P. L.* book v.)

CHAPTER IV

IMMUTABILITY OF RATIONAL LAW

§ 75. Is Reason an immutable standard and law?

Logical necessity, the law of all possible rational relations, is prior to every other form of intellectual necessity, prior to the Kantian Categories of the Sensibility and the Understanding, prior to the basal axioms of mathematics, prior to the metaphysical conceptions of Cause and Substance. It is the ultimate law of the thinking subject; but the notion of it is necessary in itself as well as necessarily formed by our minds.

§ 76. Right reason is not even the way in which the Divine Mind merely as a fact reasons. For the Divine Perfection is not accidentally or arbitrarily thus and thus; but, being its own law and having no standard outside and before itself, nevertheless could not be otherwise than it is. If we ask whence the necessity of such self-determination arises, we find ourselves at the limit of human speculation.[1]

§ 77. Mill, contesting Hamilton's assertion that 'the laws of Logic constrain us, by their own authority, to regard them as the universal laws not only of human thought but of universal reason ',[2] doubts whether they are even an original part of our mental constitution, of the native structure of the mind. He considers that we may have adopted them as part of our mental furniture by always perceiving them to be true of observed phenomena, so that the opposite has now come to be incon-

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[1] Dean Jackson (*On the Creed*) remarks upon the words 'God Almighty' that 'the possibility of contradicting or opposing Himself must by the eternal Law be excluded from the object of Omnipotence'. Bishop Butler observes that the will of the Almighty 'is as certainly determined by the principles [of right and wrong] as His judgement is necessarily determined by speculative truth' (*Analogy*, Pt. II, c. 8). Shaftesbury, however, argues that to say God is just and good is to imply that there is such a thing as justice or goodness independently, according to which God is pronounced by us to be just or good.

[2] *Lectures on Logic*, ii. 65.

ceivable.[1]   He quotes Spencer :—'The law of the Excluded
Middle is simply a generalization of the universal experience
that some mental states are directly destructive of other states.'[2]
To suppose that a law of thought is not necessarily a law of
noümenal existence is no invalidation of the thinking process.
According to Mill's doctrine, then, we only know that black
is not not-black as we know that black is not green, or that
unripe apples are unwholesome, viz. by having found it out.

§ 78. Regarding the law of Reason as merely a generalization
from the way in which men do as a fact reason,[3] a summary of
observed rules or uniformities of practice, an induction from
a vast number of examples of valid arguments,—but how are
they known to be 'valid'?—Mill looks on ratiocination as one
of the activities of the Understanding[4], with all of which Logic
is concerned.   With him, as with the Port-Royalists, Logic is
'l'Art de Penser', and a department of Psychology.   The
impossibility, therefore, of supposing logical axioms to be untrue
is but an acquired mental cramp, or, at most, a native and
inherited constitutional infirmity.   Such axioms are true because
they are universal, not universal because they are true.

§ 79. Mill, in fact, recognizes no essential rightness in Reason
as Reason, no absolute conditions of valid inference.   Yet when
he contends that 'in no case can thinking be valid unless the
concepts, judgements, and conclusions resulting from it are
conformable to fact',[5] he cannot intend to deny that valid
conclusions may be drawn from untrue premisses.   We may

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[1] *On Hamilton*, p. 491.

[2] See also Mill's *Logic*, i. 321 :—'The Principium Contradictionis I
consider to be, like other axioms, one of our first and most familiar
generalizations from experience'.   No.   Such an axiom may be con-
sciously realized with experience, but it is in truth a pre-requisite to every
mental act.

[3] Mill seems to regard a conclusion as following from the combination
of the properties of two propositions in the same phenomenal way that an
explosion follows upon the union of a match and powder.   'Follows', in
fact, merely means 'results.'   'Res constringitur, non assensus.'

[4] According to Hobbes nothing is required to make reasoning possible
but senses and association.   Reasoning is only an assemblage of names
connected by the word *est*.   We reason not about the nature of things
but about their appellations, which are purely arbitrary, and are ex-
changed like counters.

[5] *On Hamilton*, p. 471.

reason connectedly from the most extravagant propositions—
'Si j'étais roy,' or 'If all the trees were bread and cheese
and all the sea were ink.'[1]   If Sigwart is right that Logic is
'a technical science of Thought directing us how to arrive at
certain and universally valid propositions', logical thought
cannot be looked for from a person who begins : 'If I were
you, I should do so and so.'   One person cannot be another.

§ 80. Though the conclusions of logical arguments can only
be conditionally true, yet we claim absolute certainty for the
bases of Logic itself.   In everything else 'nous cherchons par-
tout l'absolu et ne trouvons que le relatif'.   But the logician's
starting-point is the one metaphysical Absolute, not this truth or
that, but the reality of Truth itself.[2]   This is the primary and
ultimate notion of Being and of Knowing.   Logic can only
prove its own principles by means of those principles ; indeed,
they can only be questioned by being assumed true.   Reason
can neither be established nor subverted save by an act of
reason.   Even if it could be shown to be certainly false, that
would be equivalent to showing it to be possibly true ; for its
falsity could only exclude its truth on the supposition that
contradictories are incompatible, which is the very thing that
was denied.   To disprove reason by reasoning is to stultify
oneself.   To expose unreason by reasoning is to beg the ques-
tion.   Nothing, some one has said, which is worth proving can
be proven—certainly not the process of proof itself.

§ 81. If inferences are not borne out by facts we are puzzled.[3]
But while we may suspect the facts, or our premisses, or else
look for some flaw in the reasoning, we never for a moment
think that a correct deduction, however complicated and pro-

[1] Or those great subtilties and high suppositions which Latimer
ridicules as discussed in pulpits; 'as whether, if Adam had not sinned,
wee should have had stockfish out of Iseland ; and how many larkes for a
peny if every starre in the element were a flickering hobby.'

[2] That reality I cognize with the same immediateness of consciousness
with which I cognize my own existence ; indeed the two cognitions are
really the same.   Now to speak of the consciousness of my own mind by
my mind as relative to my mind splits impossibly into subject and
object the primal, original fact of my being.   To make a man's self non-
Ego to himself, like a kitten chasing its own tail, is meaningless.

[3] Τῷ μὲν ἀληθεῖ πάντα συνᾴδει τὰ ὑπάρχοντα, τῷ δὲ ψευδεῖ ταχὺ διαφωνεῖ
τἀληθές (Ar. *E. N.* i. 8, § 1).   Parmenides speaks of the unchangeable
heart of truth—ἀληθείας εὐπειθέος ἀτρεκὲς ἦτορ.

tracted, from true premisses can be at variance with reality. Thought is about things, that is to say, about their relations; and if the thinking is right the things are as they are thought.[1] Having determined by pure reason that the square of the hypotenuse equals in area the combined squares of the sides, I am certain that I shall find it so also by actual measurement. The multiplication table holds good, when tested, whatever be the objects multiplied, and the answer to a schoolboy's sum is not only to be found at the end of the book but can be verified in marbles or cherry-stones. Such verification confirms us in the idea that we have multiplied correctly, but does not in the least strengthen our belief in the laws of arithmetic. Truth, says Pascal, consists not only in the conformity of ideas with facts, but also in the conformity of facts with ideas—i. e. with reasonings.

§ 82. There is no mystery, then, in the correspondence between a rational conclusion from assured *data* and the realities of experience. This is no pre-established harmony between Thought and Things, between Mind and Matter; nor is it a psychological surprise. If an abstract law does not hold good in concrete instances—assuming that they *are* instances (no actual circle, for instance, is a true circle) and that there is no counteracting law—it is merely *flatus vocis*. It is to understate the result of supposing non-correspondence between rational and actual to say that it makes our thought an illusion.[2]

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[1] Bain, however, says :—' That we should abide by a declaration once made is indispensable to all understanding between man and man. The law of necessity, in this sense, is not a law of things but an unavoidable accompaniment of the use of speech' (*Mental and Moral Science*, c. vi, § 7). Elsewhere his standpoint is even more crudely empirical.—'The impossibility of carrying on intercourse by language on any other footing compels us to be consistent in our statements. . . . We are not always so. If we could get on as well by maintaining an opinion in one form of words while denying it in another, there appears to be nothing in our mental constitution that would secure us against contradicting ourselves' (*Logic*, Pt. I, Introd. § 21). The question, however, is, Why cannot two conflicting statements both be *true*? If the only reply is that facts are found by experience to be always consistent, we naturally ask whether this is an accident or due to some necessity. Might it be otherwise in Mars ?

[2] Hamilton, for instance, says :—' Unless existence and non-existence be opposed objectively in the same manner as affirmation and negation are opposed subjectively, all our thought is an illusion.' But the lesser

To affirm a statement to be ' true ' but the facts to be otherwise would be to say and unsay simultaneously, involving mental self-destruction and the overthrow of the very idea of truth, and so of existence. Language would then be a mere making of mows. Mill asks :—' If the reality of thought *can* be subverted, is there any peculiar enormity in doing it by means of thought itself?'[1] Substitute ' reason ' for ' thought ' and the question surely needs no answer.

§ 83. For the mind's apprehension of the Law of Rationality goes deeper even than the irresistible assurance (πίστις) which is the prime starting-point of demonstration and the ultimate criterion of knowledge. It is the *sine qua non* of the mind's existence ; and the idiot or bedlam, however the ' sweet bells ' be jangled and out of tune in his understanding, is no more able to violate this pre-supposition of all being than is the sage.[2] The axioms of Geometry and of Arithmetic might be supposed— though not conceived—as non-existent apart from Space and Time, or for intelligences different from our own. The entire basis of discourse would not be overthrown by such a supposition. But that the principle of Truth's self-coherence should not be valid eternally, everywhere and universally implies the suicide of Thought itself. We are confronted with no mere contingent limitation of the thinking subject. Not all notions which are necessarily conceived are conceived as necessary. It is not only, ' I must think it to be so ', but, ' I must think that it must be so ', and to think otherwise is not to think at all. Were it possible, it would involve ' the sameness of all facts and all assertions and the meaninglessness of all alike, as well as the

question of correspondence between our ideas of the external world and the noümenal realities is not at present before us. It is only by faith that we believe that ' Ideas are God's thoughts ' (Wyclif), that ' all images formed by the mind correspond to patterns present to the Creator's mind ' (Clarke, *Logic*, p. 110). Belief, however, that there is such a thing as Truth is more ultimate even than faith.

[1] *On Hamilton*, p. 493.

[2] Horace Walpole, describing (April 19, 1761) the trial of Lord Ferrers before his peers on a capital charge, observes :—' He behaved rationally and coolly ; though it was a strange contradiction to see a man trying, by his own senses, to prove himself out of his senses.' But Lord Ferrers was not trying to prove that proof is no proof. It is often said that if most men were mad they would have a right to call the rest of the world mad. Not if madness were an incapacity for ratiocination.

indifference of all conduct'.[1]   And the moment we built any judgement upon the supposition of the untruth of Reason, we should be asserting its truth again.   Scepticism, to be consistent, should be speechless, neither affirming anything nor denying anything; for all affirmation and denial implies the existence of truth.   And yet how can we require one who says there is no law of consistency to be consistent?   But this way madness lies.   The brain reels.   'We assert nothing,' said the Pyrrhonists; 'no, not even that we assert nothing.'   That is, they asserted that they did not assert that they asserted nothing.[2]

> So little do we know what we're about in
> This world, I doubt if doubt itself be doubting.

§ 84. Something should be here said about the distinction assumed above between Reason and Thought, by which latter word I mean the intellective comparing and judging activity of the mind.   'The activity in which all intentional Thought fulfils its purpose is Judgement' (Sigwart, *Logic*, ed. Dendy, i. 16).   According to Sir Toby Belch, 'Judgement and Reason have been grand-jurymen since before Noah was a sailor.'   And though we cannot judge without an element of inference—so that the judgement, 'It is raining,' is equally an inference whether it be a drop felt on my cheek, or the seeing passers-by put their umbrellas up, which makes me say so—yet the recognitive act of bringing a presentation of consciousness under this or that rule or general notion is, taken as a complete product, an act of the judgement rather than of the reason.   There are other general propositions which might have been framed about open umbrellas.   But my understanding selected as important the general proposition that they show that rain is falling, and united to that proposition the consciousness that I now saw them open.   Reason then compelled inference, and the judgement, the ideational activity, was complete—'It is raining.'

§ 85. Much wider significations may be assigned to the word Thought, which has been used to include even Intuition.   According to Lewes, 'the current English use expresses all operations of the Thinking Principle, and is tantamount to the

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[1] Wallace, *Outlines of Aristotle's Philosophy*, p. 62.
[2] 'Etiam qui negat veritatem esse concedit veritatem esse; si enim veritas non est, verum est veritatem non esse' (S. Thom. Aq. *Summa*).

common intellectual ground of Sensibility, Judgement and Reason.'[1] 'A thing which thinks,' says Descartes, 'is a thing which doubts, understands, conceives, affirms, desires, wills, and does not will, which imagines also and feels. All the operations of the will, of the imagination and of the senses, are thoughts.'[2] According to others, Thought excludes emotion, and does not by itself excite the will to action, but includes memory and imagination.[3] Hamilton regards it as comprising all our *cognitive* faculties,[4] from simple apprehension to our grasp of the widest generalizations. In a narrower sense Thinking, he says, is limited to the mind's discursive energies, but in a wider meaning it is coextensive with consciousness.[5] 'Not a single reason has been alleged to induce us to waver in our belief that the laws of thought, and not the laws of reasoning, constitute the adequate object of the science' of Logic.[6]

§ 86. The Kantian distinction[7] between Thought (or Understanding) and Reason was much insisted on by Coleridge.[8] For him Reason is the organ of spiritual apprehension, a power of intuitive insight into fundamental truth—so that 'animalis homo non percipit.'

§ 87. Whether this distinction be a right one or not, it is not the distinction between Reason and Thought which is here intended. I do not understand by Reason the intuition generally of axiomatic first-principles, such as those of mathematics, or of primal entities and eternal verities, such as Goodness

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[1] *Hist. of Philos.* ii. 505.

[2] *Medit.* ii. 11.

[3] διάνοια αὐτὴ οὐδὲν κινεῖ (Ar. *Eth.*).

[4] *Discussions*, App. I.

[5] Reid's *Works*, p. 222 n.

[6] See Hamilton's *Discussions*, pp. 131–4.

[7] Kant, dividing Intelligence into Sensibility, Understanding and Reason, and regarding Understanding as the faculty of judging, which again is identified with thinking, makes Understanding the province of Logic and Reason the province of Dialectic. It is Reason which reduces the variety of judgements to their final unity, according to the three forms of reasoning, the categorical, hypothetical and disjunctive. It is the general faculty which contains all the faculties of cognition. Yet Kant uses Reason to mean also the mind's ratiocinative power.

[8] 'Our Shakespeare, in agreement both with truth and the philosophy of his age, names the Understanding "discourse of reason" as an instrumental faculty belonging to Reason ; and Milton opposes the discursive to the intuitive, as the lower to the higher—

Differing but in degree, in kind the same.'

(Coleridge, *Church and State*, App. B.)

and Beauty, but the necessary law, and our responsive apprehension of it, that the connexions of Truth must be self-consistent. If this exclusive meaning placed upon the word Reason be traversed, at any rate it is one important meaning of the word. And what is here urged is that Reason (λόγος) and Thought (διάνοια)—taking the former to mean the ratiocinative imperative, and the latter the judicial, cognitive or cogitative activity—are two entirely different things. Logic is neither Noetic nor Dianoetic. And though the forming of correct notions, that is of right thoughts about things, may be much more important than the drawing of valid conclusions from antecedent *data*, it is not the province of Logic.

§ 88. Thought is of various kinds, but Reason is one. Again, if we think wrongly we are not called illogical but mistaken. Erroneous thinking is that which does not correspond with actuality—*idea non convenit cum ideato*—, but the thought is not destroyed by being erroneous. Erroneous reasoning, on the other hand, cannot be exhibited as reasoning at all. It has no correspondence with itself, and simply falls into nothingness. Again, Reason governs Thought, the bands and links of which are dirigible by, and subject to, the principle of Rational Necessitation. By 'laws of Thought' we mean either the constitution (which might perhaps have been different) of the thinking faculty, or else the regulation which the connexions of our thought *receive* from Reason.

§ 89. The law of Reason, on the other hand, is an absolute standard imposed *by* Reason. So that all operations of Thought have a double limitation—Thought's own constitution and the obligation to obey Reason's behests. We are said to 'see reason', to be 'taught reason', to 'have reason'—the French expressions 'avoir raison' and 'avoir de la raison' distinguish the objective law and the answering power of the mind—, to be reasonable (ἐπιπειθεῖς λόγῳ) and unreasonable. Like the word 'rational', 'reasonable' formerly had the double sense of according with reason (e. g., 'a reasonable price'), or of exercising reason (e. g., 'a reasonable soul,' 'our reasonable service').

§ 90. Though the law of Reason be not always consciously apprehended, it is from moment to moment obeyed by all ' God's order or society of rational beings '. Coleridge remarks that

we do not possess Reason but partake of it. Reason, therefore, 'cannot rightly be called a faculty, much less a personal property, of any human mind'. We have it κατὰ μέθεξιν, not κατὰ οὐσίαν. In the same way Conscience is not a separate faculty, but the supreme principle of moral unity in a man's nature. In the Platonist and the Christian view, 'godlike Reason' is both the light and the inward eye.[1] It is subject and object in one, λόγος and ὁ λόγος, and within it is the sphere of Logic.

§ 91. Why then, it may be asked, does not rational argument always carry conviction, and how is it that men reason wrongly? Why so often is the truth on one side and the votes on the other? Is the law of Reason a precept laid upon free intelligences, to accept or reject? Why is it not enough to supply an opponent with reasons, without supplying understanding also?

§ 92. I believe it will be found, on examination, that what is called false reasoning is always at bottom misapprehension. Either there is an inability to grasp the significance and bearing of the materials supplied to the reason, or the reasoning is formulated in an obscure or unfamiliar shape. A man does not 'see his way through the argument'; he has to puzzle out the links, the thread, the connecting points. If he thought clearly he would reason rightly. I agree with Mr. Alfred Sidgwick that 'syllogistic fallacy, so far as it occurs at all, occurs through misinterpretation of sentences. Whenever an

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[1] Coleridge speaks of Reason as a ray of the Divinity in man, the presence of the Holy Ghost to the finite understanding. 'We see,' writes Hamilton, 'by a light which is not ours, and reason is a revelation of God in man' (*Discussions*, p. 8). He quotes Cousin, who says:—'Reason is impersonal in its nature; it is not we who make it. It is so far from being individual that its characteristics are the opposite of individuality, viz. universality and necessity. . . . Reason is a revelation which enlightens every man on his coming into the world. Reason is the necessary mediator between God and man, the λόγος of Pythagoras and Plato, the Word made flesh' (*Expos. of Eclecticism*, p. 69). The Stoic conception of the λόγος ἐνδιάθετος (God's thought) and λόγος προφορικός (its revelation in the created world), after becoming with Philo God's Firstborn and Counsellor, was raised to an entirely new plane by Christian theology. The correspondence between the 'spirit of man' and the 'Spirit of God' is perfected by the Incarnation of the ἐνυπόστατος ΛΟΓΟΣ, who is no emanation of Deity but the second Person of Trinal Godhead, in whose archetypal image humanity was originally created.

invalid syllogism is accepted as valid, some two sentences have been wrongly interpreted as equivalent to each other. In no other way, surely, can we be deceived as to whether a given conclusion is implied in given premisses'.[1] And again— 'Mistakes in reasoning are nothing but mistakes in the facts from which the reasoning proceeds.'[2] Presented with some intricate question of genealogical relationships, I may arrive at an absurd conclusion; it is not, however, my inferential power which is at fault, but the slowness of my comprehension.[3]

§ 93. It is objected that a man must at any rate understand his own thoughts—how comes it, then, that he can reason badly by himself? But each person has really more difficulty about his own thoughts than he has about those of other people. For the latter are presented to him one by one, formulated in language, and with some attempt at logical connexion. But his own ideas throng into the cramped field of the supra-liminal consciousness (to use Myers' well-known phrase), for the most part confused, shapeless, and mingled with a crowd of unreflective activities. At each moment that he would reason, these half-digested thoughts, scarcely-remembered impressions, tangled and disordered feelings, thrust themselves upon his mind. He must use them in the rough. Hamilton quotes the saying of Descartes :—' Nihil nos unquam falsum pro vero admissuros, si tantum iis assensum praebeamus quae clare et distincte percipimus '.[4] This implies, no doubt, that false thinking, and not only false reasoning, ought to be impossible. ' What is actually thought cannot but be correctly thought. Error first commences when thinking is remitted.'[5] In other words, mistakes proceed from the will, which is the parent of laziness, from prejudice, confusion, arbitrary assumption, and that inattention to the limitations of our faculties which converts nescience and suspended judgement into ignorance and error.[6]

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[1] *The Process of Argument*, p. 65.

[2] *Use of Words*, p. 362.

[3] ' "Can you do Addition?" the White Queen asked. "What's one and one and one and one and one and one and one and one and one and one ?" "I don't know," said Alice, "I lost count." "She can't do Addition," the Red Queen interrupted ' (Carroll).

[4] *Cartesii Princ. Phil.* i. 43.

[5] Twesten, *Logik*, § 308, quoted by Hamilton.

[6] ' Attention is an act of volition, and attention furnishes to the Under-

§ 94. The will corrupts the understanding.   But—

> Neque decipitur Ratio nec decipit unquam.

What, then, about madness? Is this really 'loss of reason' or only 'weak understanding' and disordered imagination? The lunatic who believes himself to be Julius Caesar or an elephant argues quite rationally on that supposition. Hamlet, in brainish apprehension of a rat behind the arras, consistently kills Polonius, and weeps to find what he has done. Ophelia, 'divided from herself and her fair judgement, Without the which we are pictures, or mere beasts,' very logically drowns herself. It is the intelligence which is unhinged. Within the world of his own in which the madman lives, the connexions of thought obey the rules of reasoning.

§ 95. It is the understanding by which the simple spatial and numerical notions are grasped. To put two and two together is an intellectual rather than a ratiocinative accomplishment. Galton tells us that the Damaras cannot count at all. 'If two sticks of tobacco be the price of one sheep, it would sorely puzzle a Damara to take two sheep and give him four sticks.' A learned pig were more arithmetical. Yet one of these inefficient cypherers on the trail of an enemy or wild creature would doubtless perform most intricate feats of inductive and deductive inference. In matters which a savage thoroughly understands, his reasoning process is swift. Zerah Colborn, having instantaneously found the square-root to thirty-three places of a number consisting of fifty-three figures, dictated it from memory twenty days after. But his purely ratiocinative power was no greater than that of Galton's Damaras.

§ 96. 'It is not the abstract principles of correct reasoning', observes Sidgwick, 'which are unfamiliar to the average man (except in their technical expression), but the limits of the safe application of those principles when the concrete subject-matter is taken into account'.[1] Children are usually very logical; where

standing the elements of its decisions. The will determines whether we shall carry on our investigations or break them off, content with the first apparent probability, and whether we shall apply our observations to all, or only partially to certain, momenta of determination' (Hamilton, *Lectures on Logic*, ii. 77). Probably, since we are partly conscious of the part played by the will in our judgements, we form nearly all of them with certain mental reserves.

[1] *Use of Words*, p. 83. Because our mistakes lie in our facts rather

they go wrong is from want of experience. They look with a certain awe for a correspondence between language and realities. Words are to them not the counters which Hobbes says they are to the wise, but gold pieces having an intrinsic value, and not simply that which he who puts them into currency chooses to stamp on them.

§ 97. All important error, Sidgwick says, arises from ambiguity of the middle term. When an arguer proves his point with triumphant but suspicious ease and simplicity, it will usually be found that the middle term has been slurred and half-skipped. Hobbes proves that no law can be unjust, since right and wrong are derived from law—which assumes that *iustum quia iussum est*, not *iussum quia iustum*. If forced by logic to state its reasoning in full, the mind will often shrink from avowing what was consciously or unconsciously implied in it. Frequently it rests upon some slovenly conception—like that of the parents who proposed to bring up their boy to the butcher's trade because he was so fond of animals—or some more or less disingenuous appeal to prejudice. So it is in the 'pathetic fallacy'. Epithets used in controversy (e. g., narrow, broad, intolerant, patriotic, firm, ruthless) prove nothing apart from circumstances. A jest, however, is usually spoiled by insistence on complete formulation. ' My dear sir,' exclaimed Pugin to a clergyman in a Roman church who was praying that England might be converted in a vesture of offensively modern pattern, 'what can be the use of praying for the conversion of England in that cope ?' So far as the great ecclesiologist's distress was serious, his unexpressed major premiss was that good taste and good religion go hand in hand. The following we should class under the head of *ignoratio elenchi*. Erasmus, having in a tract *Ciceronianus* satirized the Ciceronians, who would employ no

than in our reasoning, Sidgwick suggests very inconclusively that ' the common distinction between reasoning and judgment' is wrong. ' There is no unreasoned judgment, and no reasoning process apart from its subject-matter' (*Use of Words*, p. 362). But, because there is a reasoning element in all judgement, it does not follow that reasoning and judgement are the same thing. What Sidgwick means, no doubt, is that error resides in the other element in judgement, the non-ratiocinative, which is rather comparison than judgement itself. The starting-point of comparison is, in the ultimate psychological analysis, perceptive rather than intellective.

expression not to be found in Tully (using *Pontifex maximus* for the pope, *Dii immortales* for God, and the like), Scaliger ferociously attacked Erasmus' public and private character. Milton himself, in his prose works, is a past master in this controversial method.   But the underlying assumption is that intellectual and moral qualities are so intimately related that a scoundrel is certain to be a sophist, and to have vicious literary judgement as well.[1]

§ 98. An enormous number of arguments have, as expressed, an undistributed middle term, that is to say, no apparent universal element, and this is a fallacy in the reasoning itself. But I think there is always in such a case an assumption that the subject and predicate of the major premiss are ' convertible '. All *A*'s (*and A's only*) are *B* ; *C* is *B* ; therefore *C* is *A*.   The following example of fallacy is given in the *Port Royal Logic*.[2] A German poet, reproached by Mirandola with having introduced into a poem describing the wars of Christians against Christians all the divinities of paganism, mixing up Apollo, Diana and Mercury with the Pope, the Electors and the Emperor, maintained that without this it would not have been a poem, seeing that the poems of Homer, Hesiod and Virgil are full of the names and fables of these gods.   Obviously the German meant that mythological colouring is a predominant characteristic of great ancient poetry, and that all poetry is bound to resemble the great models in their leading features.   The contention is weak, but the reasoning, thus understood, is correct.   The same may be said—to pass from grave to farcical—of the illustrations of the advantages of water-drinking given in the report of the Brick Lane committee in the *Posthumous Papers of the Pickwick Club*.[3]   That gin and water should undermine a wooden-leg's constitution is a *post hoc ergo propter hoc* inference which depends on an audaciously convertible major premiss, the general identification of wooden-legged gin drinkers with the possessors of split

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[1] It is perhaps pursuing the point rather too seriously to quote Vinet :— ' There is a strict relation between the rectitude of the moral sense and the correctness of the mind. . . . Let us remember how rare it is that intellectual speculations are completely exempt from moral influence, how imperfectly recognized is the bearing of Will upon Opinion ' (*Metaphysics*).

[2] Pt. III, c. xx.   [3] Chap. xxxiii.

wooden legs—the circumstance that the split wooden legs had been second-hand ones being deliberately put out of view.

§ 99. A large number of fallacies arise from the point to be proved not being kept steadily before the mind. For example, boiling oil used to be counted a specific against poisoning by lead bullets; but after a certain battle, Berthon tells us,[1] it was found that the chief surgeon had forgotten to order a supply. He was court-martialled and about to be broken, 'when some one had the sense to propose that they should suspend judgement till the results of the omission were ascertained. After about a week it was found that all the wounded men were alive and doing well.' But the question was whether the surgeon had neglected his duty; and the court was 'illogical' in acquitting him. The *elenchus* is here lost sight of.

§ 100. Begging the question is sometimes a defiant assumption —'It is right for me to persecute you, because I am in the right, but wrong for you to persecute me, because you are in the wrong'. More usually it is due to confused thinking.[2] But confusion of thought has countless shapes. In 1886, the festival of Corpus Domini falling on St. John's Day, there was an apprehension among the Piedmontese peasantry that the end of the world was at hand, and many made their wills in consequence. They had a vague notion of impending death. Yet possibly they may have had a feeling that Christians ought to go to their last account with their affairs in order, their debts provided for, and a just disposition made of their goods—whether any one would be left to benefit by it or not. Mill remarks that 'men may easily persuade themselves that they are able to reason though they are not, because the faculty which they want is that by which alone they could detect the want of it'.[3] He infers

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[1] *A Retrospect of Eight Decades.*

[2] It is the conceit, not the irrationality, which takes us aback in the Paisley man's surmise that Shakespeare may very well have been born in that town, 'for his abeelities would justify the inference'. *Petitio principii* is, in fact, rather a moral than a logical fault. For if not a surreptitious, it has usually an insolent, vulgar, or foolish basis. The Northern Farmer shows that the poor in the lump are bad, for—'Tisn them as 'as munny as breäks into 'ouses an' steäls, Them as 'as coäts to their backs an' taäkes their regular meäls.'

[3] Essay on Whately's *Elements*, 1828.

that fallacies must be exposed not by common sense but by logical analysis. Logical analysis, certainly, by securing an argument being exhibited in its completeness, will enable us to lay our finger on the weak place in it, and give opportunity for mending it. But what the testators of Piedmont lacked was not logic but clearness of ideas.

§ 101. In almost every dispute there is some *petitio principii* to be hunted down. The opponent assumes that we will grant his premisses when probably we ought only to do so with qualifications. Or he extorts a concession in one sense and proceeds to make use of it in another. To our mystification or indignation, we find that an admission has landed us in an intolerable consequence. A Cambridge professor who was asked in a mathematical discussion, ' I suppose you admit that the whole is greater than its part,' is quoted by De Morgan as answering,— ' Not I, until I see what use you are going to make of it.' If I am asked to allow that an indicator which is right twice a day is more useful than one which is never right at all, I shall probably cheerfully assent, until I find that I have granted that a watch which does not go at all is more useful than one which is always a minute fast. Take this syllogism :—' Whoever says that a philosopher is an animal speaks truly. Whoever says that a philosopher is a goose says that he is an animal. Accordingly, whoever says that a philosopher is a goose speaks truly.' This looks a good syllogism. But reasoning is about thoughts, not about verbal expressions. And we notice that the first ' speaks truly ' does not refer necessarily to everything which the person may be saying about the philosopher, but only to the predicating animality of him. To call a philosopher a goose, however, is indeed to attribute an animal nature to him incidentally, but an animal nature of a certain kind. It is to say he is an animal and something more. The statement is true, then, in one part, but not necessarily in the other.

§ 102. De Morgan points out that the scholastic logicians were so practised in reasoning, and so unaccustomed to a formal fallacy being adhered to one moment after being pointed out, that they treat almost entirely of material fallacies ; whereas with us inaccurate reasoning is very common, and its exposure is regarded as a pedantic quibble. But this only means that we are impatient of form and theory, and resent having to recast

an argument so that it shall conform to logical rules.[1] The slipshod reasoning which makes the wise despair of an age of cheap discussion springs from undisciplined judgement and hazy conception rather than actual paralogism. Confused materials are supplied to the mind to syllogize. Fallacies, in fact, are really psychological rather than logical. Logic forces them into the light, but does not show why we make them. If we are to think aright, the all-important thing is the bringing things under the right notions. The ratiocinative energy can be left to take care of itself, if only it is supplied with notions at once clear and distinct—made clear by definition and distinct by division.

§ 103. 'We are wrong,' says Vinet, 'in speaking of reason misled, reason corrupted. In itself it is never corrupted. It is the elements on which reason operates that are corrupt. And just as reason alone cannot pervert, so neither can it redress alone.'

§ 104. The classification of fallacies is treated so fully in the ordinary books that it need not be handled here.[2] Mansel adopts a threefold division—Fallacies in the Thought, Fallacies in the Matter, and Fallacies in the Language—Aristotle's παραλογισμοὶ ἐν τῇ λέξει.

'Strictly speaking,' he says, 'Formal Fallacies alone come under the cognizance of the *Logica docens*, or logic properly so called, as being apparent but not real thoughts, or at least not the kind of thoughts which they profess to be. Material Fallacies, where the thought is legitimate but the relation to things inaccurate, belong properly to the province of the *Logica utens*, and can only be adequately guarded against by that branch of knowledge which takes cognizance of the things. A minute division of Material Fallacies may thus be carried on to an indefinite extent. . . . Fallacies of Language, it is obvious, will become more numerous as the process of thought becomes more complicated. . . . Any defect in this indispensable instrument of thought is communicated to the operations which it performs.'

§ 105. If, however, our contention is right that it is always our understanding and not our reason which is deceived, formal fallacies are at bottom fallacies either of matter or of language.

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[1] Unlike the Oxford man of the old Aldrich days who came away from a sermon indignantly exclaiming, 'The rascal made a fallacy in *Baroco*!'

[2] e. g. in Mansel's *Aldrich*, App. M, and his *Prolegomena Logica*, chaps. iv and v.

No one with a perfect comprehension of the terms he is using and of their propositional relations would ever syllogize wrongly.

§ 106. A further question should be glanced at before this chapter closes. Is it possible to be 'too logical'? Not unless it is possible to be too rational. If a man is unreasonable he is not really rational. Carlyle assures us that 'not the least admirable quality of Bull is, after all, that of being insensible to logic'. Less complimentarily it has been said, 'L'esprit anglais est très inconséquent.' The Englishman usually thinks that he can carry a principle just so far as is convenient, and no further. Macaulay speaks of the promoters of a bill in Parliament caring little about the major premiss contradicting the conclusion if the major won two hundred votes and the conclusion a hundred and fifty more. On the other hand De Tocqueville said of his countrymen :—'We are too logical, and cannot endure any institution in which a blemish may be found.' French thought is rectangular and somewhat unimaginative.

§ 107. If our premisses are exactly and certainly true, we cannot too logically act upon them. To do otherwise is to be irrational. It has been remarked that when we are right we are always more right than we believe ; if we hold a truth we never believe it enough, never trust it sufficiently. What is faith but the deductive loyalty to convictions of unseen things which refuses to be turned out of the way by the things of sight, and is verified by obedience ? On the other hand, terms used in religion ought always to be filled with content, not used as tokens but realized in heart and understanding. Otherwise preciseness of thought may lead to an 'horribile decretum, fateor '.[1] St. Paul's logic is ever spiritual and human, not algebraic, wooden, and 'hard-church'. Still, it is right to apply principles steadfastly. It was said of Hurrell Froude :

[1] See Calvin's *Institutes*, lib. iii, c. 23, § 7, on the doctrine of irrespective reprobation. But, though the impossibility of expressing Divine mysteries adequately and without one-sidedness makes an over-dogmatic temper dangerous—' non in dialectica,' says St. Ambrose, ' complacuit Deo salvum facere populum suum,'—yet, if truth has been revealed to human intelligences at all, it must be capable, under Divine guidance, of deductive elucidation. There is a softness about the blurred and hazy outlines of English beliefs, as of English scenery. But much of the cheap contempt of popular writers for scientific divinity is nothing but a preference for illucidity and down-at-heel slatternliness of thought.

'He is not afraid of inferences.' The weakness of the English mind, which is seldom extremist and intransigeant, is usually a shrinking from all methodical and definite thought. George Eliot avers that this trimming extends even to the exact sciences, and that an Englishman, confronted with the proposition that the radii of a perfect circle are equal, struggles to avoid assenting to more than that they have, under favourable circumstances, a tendency to be equal. He would sooner make an answer in arithmetic highly probable than prove it.

§ 108. Nevertheless, how few ordinary rules are true unreservedly. And, again, how soon a formula gets separated from the idea which it never, perhaps, perfectly expressed. For language—to adopt Bosanquet's phrase—fits thought like a loose glove. The glove may slip off and keep the shape of a human hand, yet lie empty. Vinet apologizes for a forcible image. He says :—

'Unless we constantly hold fast the idea, we lose it on our way, and perhaps at the beginning of the way, much as a postillion riding his horse, and turning his back to the carriage, may chance to leave it on the road, and arrive at the journey's end with nothing behind him. This cannot happen in an algebraical calculation, where the separation of the sign and the thing signified never takes place. In reasoning upon moral matters, it is a condition of safety to keep incessantly testing the substance of ideas. Dialectics end by reconciling the mind to enormities. It becomes callous, as does the hand that has too long grasped a hard tool. There are truths and errors to which we soon cease to be sensitive.'

§ 109. Vinet, however, goes on to say :—

'I have never understood that species of disdain which is nowadays affected for theory, which is continually contrasted with practice. Theory is nothing else than truth itself. Theory is inflexible as truth ; it survives all the usurpations of violence and all the sophisms of injustice, and in the midst of disorders presents itself majestically as the indelible type of all that ought to be.'

He objects to a remark made by Catherine the Great to a theorist :—'You work on paper, which endures everything ; and we unfortunate monarchs have to work with human flesh and blood.' No, Vinet urges. 'We must, no doubt, take man as we find him ; but we must not leave him there. This expression of Catherine's, taken absolutely, is a protestation against

principles, against the invisible, against the ideal, against God. Let us take account of facts; but let facts also take account of principles.'[1]

§ 110. Again, that there is a logic of the heart does not prove that the heart's reasons—'le cœur,' says Pascal, 'a ses raisons, que la raison ne connoît pas'—have not at bottom a rational character, admitting of formal explication. It may not be easy to reduce the lightning-like conclusions of the emotions and passions to syllogistic form. A woman's mind is called illogical because it is intuitional. She sees things in a flash. Compared with man,

> Her subtile wit
> At that which *he* hunts down with pain
> Flies straight and does exactly hit.[2]

And if challenged for her reason she very likely gives an absurdly wrong one. She knows her boy will get a First Class because he has such a noble disposition. Seek to convert her to Rome with all the folios of Bellarmine, or to Geneva with Calvin's whole armoury of texts, she will reply, 'Oh, but you should hear dear Mr. Cope preach.' Still the reasoning is there, and the illogicality is often on the surface. The nut is not really got at without cracking the shell, nor even feminine conclusions reached without grounds. After all, 'I think it so because I think it so' is the ultimate reason for all belief.

§ 111. Lastly, we do not expect in imaginative literature that statements shall bear the weight of every inference which might formally be based on them. The poet leaps broad chasms of the unexpressed. He reasons by imagery. He does not trouble to express facts with pedantic preciseness. When Tennyson writes—

> Every moment dies a man,
> Every moment one is born—

we do not suppose him to wish us to infer that the population remains stationary, any more than we suppose Macaulay to give the Huguenot horsemen at Ivry one spur apiece in the lines—

> A thousand spurs are striking deep, a thousand spears in rest,
> A thousand knights are pressing close behind the snow-white crest.

[1] *Metaphysics.*   [2] Patmore.

On the other hand, Renan says of Claude Bernard's prose style that it 'repose sur la logique, base unique, base éternelle, du bon style '.

NOTE.

Of the Doctor Illuminatus, Raymond Lull (1236–1315), 'the most eccentric product of the scholastic age,' it is said :—

' His great aim was to identify philosophy and religion. He undertook to demonstrate the highest mysteries of faith and to spiritualize the plainest forms of science. . . . He often treats the exalted verities of religion with cold formality, but kindles into rapt enthusiasm at the contemplation of logical forms. In the missionary enterprises to which so much of his life was devoted he laid little stress on the ordinary signs of apostleship, on the living voice uttering living truth under the consuming fervour of higher inspiration and with the witness of marvellous signs ; but in place of these propounded his Art of Mechanical Syllo-gistic, which he successfully forced on the attention of kings, popes, cardinals, and councils, as the true theological machine for the conviction of the infidel and the conversion of the world. In this his great art (*Ars magna Lulliana*) his aim was to reduce all the operations of thought to a mechanical sim-plicity, or rather to enable any one to investigate all relations and discourse of all truths, without the trouble of thinking at all. It is an attempt to determine *a priori* not only all the possible forms, but almost all the possible matter, of thought. He endeavoured to do this by means of circles . . . so that, by allowing the first circle to remain stationary and the others to revolve, all the attributes and relations which belonged to a subject should in turn be assigned to it. This mechanical scheme has a certain grandeur of purpose. Leibnitz, in his treatise *De Arte Combinatoria,* has treated it with seriousness and, to some extent, with approval' (T. Spencer Baynes' translation of the *Port Royal Logic,* xiv).

Lull, however, has been styled 'the greatest of mediaeval missionaries'. His practical labours were enormous, and closed in martyrdom. Moreover, using a method the antithesis of the Baconian, he drew scientific attention to the possibilities of the magnetic needle and to the idea of a sea-route round Africa.

CHAPTER V

REASON REGULATES THOUGHT

§ 112. Having distinguished Reason and Thought, and seen that the former imposes absolute and irresistible behests upon the latter, we now go on to consider the law, or laws, given by Reason to Thought generally, and next the rules governing the connexions of Thought constituted as ours is.

§ 113. Thought, for us, is a 'knowledge of things under conceptions', a knowledge of one thing or notion 'through another'. It is discursive, a running to and fro, between fact of consciousness and idea, a comparison, a recognition of similarity and difference. We come to know each thing by something which we know better.

§ 114. The Divine Thought, on the other hand, is intuitive and immediate. All things are naked and open unto it. We conceive, judge, syllogize. But to an Intelligence free from limitations all knowledge is spread out, not cognized but contemplated. Nor can it be supposed that the mind of Deity draws consequential inferences, or proceeds from known to unknown. For though we say that a conclusion follows—'as the night the day'—yet regarded objectively in itself the conclusion comes into existence simultaneously with the conjunction of the premises.

§ 115. Yet, even though the Thought of a perfect Mind be an open vision of truth, it obeys the imperative of Reason, which is violable neither by the instinct of the brute nor by the Νοῦς Βασιλεύς itself. Logical law not only does not admit of modification in the way that physical laws blend with and modify one another. It also transcends even mathematical necessity. For example, the distance of a star may be determined partly by spectrum analysis and partly by stellar parallax. The former rests on natural laws of chemistry which we find hold good billions of miles from our earth. But the measurement of distance by the geometrical properties of lines and angles—given, of course, true measurements and eliminating physical questions as to the refraction of light, optical deception, and so forth—rests on a postulate

wholly different from the idea of physical uniformity.[1] Given our spatial conceptions, the theorems of Euclid have an absolutely universal validity. The laws of space govern all human measurement. We not only 'fail to see' how parallels can meet, but we are obliged to think they cannot.[2] I am assuming that not meeting is no part of the definition of parallel lines. It is an old question whether mathematical axioms are analytic or synthetic.

§ 116. The Law of Rationality is of a still more universal reach than the Laws of Mathematics. It transcends Space and Time. It cannot be thought as operating less in the spiritual than in the sublunary sphere. It is ultimate and sovereign, and governs all thinking whatsoever and wheresoever.

§ 117. There must be an ultimate postulate both of the Matter and the Form of Reasoning. We are concerned here only with the latter. The Law governing the formal relations of thought is twofold. On the negative or prohibitive side it is the Law of Consistency. On the positive and obligatory side it may be called the Law of Persistency. The former disallows the conjunction of formally inconsistent attributes or the co-statement of two conflicting propositions. The latter justifies and compels the thinking of whatever is formally implied in a conception or judgement, or connexion of judgements. The former is expressed in the double Principle of Contradiction and Excluded Middle ; the latter in the Principle of Identity. These are the metaphysical bases of logic. They are not merely the 'negative conditions of the thinkable'.[3]

At bottom, the three Principles are one and the same, and if one could be supposed violable the other two could not stand.[4]

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[1] 'The measure of a man, that is of an angel' (Apoc. xxi. 17). But we might be constituted to apprehend a world of four dimensions. See C. Howard Hinton, *The Fourth Dimension* ; Swan Sonnenschein, 1904. A history of the doubts raised respecting Euclid's assumptions about Space to the end of the eighteenth century will be found in Stäckel and Engel's *Theorie der Parallellinien von Euclid bis auf Gauss*, Leipzig, 1895.

[2] Dr. Bosanquet says :—'You cannot prove that parallels never meet. In order to do so, you would have, like the Irishman, to "be there when it did *not* happen"' (*Logic*, i. 339). But this is to make mathematical necessity a mere empirical summary of observations.

[3] Hamilton (*Lectures on Logic*, i. 106).

[4] Hamilton says :—' The laws of Identity and Contradiction infer each the other, but only through the principle of Excluded Middle ; and the principle of Excluded Middle only exists through the supposition of the

§ 118. The Principles of Contradiction and Excluded Middle are the same principle regarded from opposite sides. Together they constitute the law concerning Contradictories. The one denies that, if a statement be true, it can at the same time and in the same sense be untrue, or that if a statement be untrue it can simultaneously be true. The other asserts that a statement must either be true or be untrue. That is to say—since this is the meaning of 'either ... or'—if it is not the one it must be the other. In other words, if a statement is not true it must be untrue, and if not untrue it must be true.

§ 119. The Principle of Contradiction—which Hamilton prefers to call the Principle of Non-Contradiction, *principium non-repugnantiae*—declares that if a statement be true the contradictory of it must be false. The Principle of Excluded Middle declares that if a statement be false the contradictory of it must be true. In other words, of two mutually contradictory propositions both cannot be true, but one must be. Of the two one is true, and only one.

As the self-evidence of both these Principles has been called in question, something more must be said about them.

The Principle of Contradiction.

§ 120. When we say that a proposition cannot be both true and false—*non est simul affirmare et negare*—we are asserting something about the nature of Existence. We are not stating simply a mental limitation—as that two attributions cannot be combined in one act of consciousness, or that no object can be thought under qualities known to be incompatible. But we are making an ultimate assertion about the truth of things in themselves. We are laying down, in fact, what we mean by truth. And we say that we are logically precluded from making two contradictory predications about a subject because, metaphysically, an object cannot possess a quality and also not possess it. For a thing to be itself, a characteristic which it now has cannot also now be absent from it. The point must not be confused by the introduction of questions about personal continuity ; as whether

two others.' These two cannot *move* without the third ; and without them the third cannot be conceived as *existent* (*Lectures on Logic*, ii. 244). Mr. Stock holds that each law is independent (*Logic*, pp. 6, 7).

Socrates seated is identical with Socrates standing; or whether Ludovicus Rex is 'himself' as Ludovicus without the Rex; or whether St. Hubert's hunting-knife was the same knife after being several times re-bladed and new-handled.

It is difficult to state a truism without making it a mere tautology. But even tautology is in form assertive; whereas the possibility of assertion, implying the existence of truth, is what is really impugned when the Principle of Contradiction is impugned.

§ 121. The Empirical School, as we have noticed, see in this Principle merely a statement on our part that by long familiarity with the contingent circumstances of truths not conflicting we have come to be incapable of conceiving such confliction.[1] Grote writes:—'You can only prove the Maxim of Contradiction by uncontradicted appeals to particular facts of sense; and if your opponent will not admit these facts of sense you cannot prove it at all.'[2] Dr. Bradley, after pointing out that there is no logical principle which will tell us what qualities are really disparate, goes on:—

'In logic we are not called upon to discuss the principle but to rest upon the fact. Certain elements we find *are* incompatible and, where they are so, we must treat them as such. It can hardly be maintained that there *are* no disparates except those qualities which at the same time imply each other. And the Law of Contradiction does not say any more than that, when such sheer incompatibles are found, we must not conjoin them. Its claims, if we consider them, are so absurdly feeble, it is itself so weak and perfectly inoffensive, that it cannot quarrel, for it has not a tooth wherewith to bite any one.'

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[1] Even Ueberweg is found doubting whether the Principle of Consistency is fundamental, underived and unchallengeable. He looks for the ultimate rational principle in the correspondence of the content of perception and thought with existence (*System of Logic*, § 77). But in what sense is the perception of that correspondence 'rational'? Locke (*Human Understanding*, iv. 7, 9) says:—'A child certainly *knows* that a stranger is not its mother, that its sucking bottle is not the rod, long before he knows that it is impossible for the same thing to be and not to be.' Before he realizes it consciously, no doubt. But the child could not apprehend mother, bottle or rod as constants if at the back of all its knowledge there were not the idea of truth. And truth means that a thing cannot both be and not be.

[2] On Taine's *De l'Intelligence*. Minor Works, p. 359.

And, in the same comico-metaphysical vein, just before :—

'This axiom is not like the principle of Identity. It is a very old and most harmless veteran ; and for myself I should never have the heart to attack it, unless with a view to astonish common sense and petrify my enemies.'[1]

So that to say that a button cannot be both off and on is on the same level as the proposition that it cannot both be made of horn and be worth twenty thousand pounds ; and to say that a building is at once empty and not empty is on the same level as the proposition that it is at once fireproof and built of pine and thatch.

§ 122. There are some native incapacities of conception which are part and parcel of the mind's structure and yet are seen at once to involve no limitation of reality. We can conceive nothing of which, or of the elements of which, we have had no outer or inner experience ; for example, infinity. A man born deaf cannot conceive harmony of sound. A street hooligan cannot conceive the pleasure which the connoisseur gets from a delicate piece of Sèvres or a fine proof engraving. The happiness of an unselfish life is a sealed book to the selfish, and there are many things in religion which are too high for our conceiving, but which nevertheless we believe true.

§ 123. On the other hand we assert with Aristotle and with mankind that τὸ αὐτὸ ἅμα ὑπάρχειν τε καὶ μὴ ὑπάρχειν ἀδύνατον τῷ αὐτῷ καὶ κατὰ τὸ αὐτό, and that this is πασῶν τῶν ἀρχῶν βεβαιοτάτη,[2] the indispensable condition of thought and of truth, guaranteed both by the impossibility of making or believing any assertion whatever unless it be conceded, and by the primary instinct of mental self-preservation. It is a choice between this and an Heraclitean flux of all things.

§ 124. Hegel, however, confines the Principle to the sphere of phenomena. All contradictories are reconciled in the sphere of the Absolute by a higher unity, as partial aspects of a more comprehensive truth. Motion and change—each thing passing into something else—imply contradiction at every instant, a union of being and not-being in the same object at the same moment. But not only does nothing come into being without its opposite in thought : all *assertion* in itself necessarily involves a correlated contradiction, and every say is a gainsay. Silence

[1] *Logic*, pp. 136–41.   [2] *Metaph*. i. 3, 1005ᵇ, 20.

implies sound, order implies confusion, compulsion implies freedom. Thus identity and difference are mutually creative. The clearness of a notion is obtained by differentiation and the recognition of limitation. *Omnis determinatio est negatio.* Limitation is essential to consciousness. We cannot know *A* without being aware of non-*A*. The identity (co-existence?) of contradictories is the very condition of being and of knowledge.

§ 125. Pure being and pure not-being are, in this theory, identical because they are species of a common genus, the Unconditioned, and so have a common nature. In union they constitute the conditioned existence around us. The Absolute (i. e. God) is the abstraction from, and *prius* of, every discrimen and particularity—the whole sum of possible logical consciousness. The Hegelian Logic expounds Him in His essential self-Existence before being differentiated into this, that and the other concrete creation. Being, passing through not-Being, is determined as quality of things. There is a perpetual Becoming or development, a transition from the notional to the actual, an unresting river of thought. Not-being is necessarily thought simultaneously with being, and, since the process of thinking is the process of creating, necessarily co-exists with it.

§ 126. There appears to be in this doctrine a fundamental confusion between not-being and being not (observe the absence of the hyphen), between 'aoristic' negation, or mere otherness, and contradiction.[1] An object cannot have an attribute and not have it. But it can have an attribute and also have a number

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[1] Prof. Caird points out ('On the Evolution of the Idea') that in Plato's *Sophistes* τὸ μὴ ὄν is not the negation, but only the other, of ὄν. If the Real is real, It, or He, cannot be modified as true and also as false. God cannot be the perfect indifference of contraries if He is the Truth, the Amen, the Yea—not a higher unity of Yea and Nay (2 Cor. i. 17–20), 'He abideth faithful; He cannot deny Himself.' The 'catholicity' of ἡ ἀλήθεια is a synthesis not of contradictions but of contrasts. Every statement about Reality is a limitation, and to transcend limit is to pass into the sphere not of the Absolute but of the Meaningless—why should it not be equally entitled to a capital letter? To be blind to the complementary aspects of the *depositum fidei* is the partiality of αἵρεσις. But one-sidedness is preferable to a boneless and pantheistic mysticism. The oecumenical Confessions, by affirming the doubleness and completeness of truths (e. g. 'licet Deus sit et Homo, non duo tamen sed unus est Christus'), shut out the narrowing explanations advanced by particularism on the one side or the other.

of other attributes which are not that attribute. Length is not breadth ; yet a table may be both long and broad. To be rich is not to be thirty years old ; yet a man may be both. In relation to every attribute all other attributes are not it, are other than it. ' Not *A*-ness ' (by which is meant ' a quality which is not that of *A* ' rather than 'the quality of not being *A* ') embraces the potentially infinite number of qualities which are not identical with *A*-ness. Now, if an object had only the one quality, *A*-ness, it could not be distinctly known, for all knowledge is by distinction. To say that it is *A*, then, is to imply that it is something else, *B*, *C*, *D*, &c., as well—*B*-ness, *C*-ness, *D*-ness, &c., not being *A*-ness. In this sense 'being' involves the existence of 'not-being' in the same subject. Though *B*-ness is not *A*-ness, though age is not wealth, yet a thing may be both *B* and *A* : a merchant, e. g. may be both aged and wealthy.[1]

§ 127. On the other hand contradictory 'being not' has only a *notional* correlation with ' being ', and cannot co-exist with it in *predication*. A man may be of noble birth and bankrupt, but not of noble and of ignoble birth. He may be prejudiced and athletic, but not prejudiced and unprejudiced. It is not even certain that a positive impression always calls up an opposed idea. If the whole universe were a uniform blue, we should distinguish the colour of things from their shape and other qualities ; but we could not, I think, frame the conception of not-blue extension. We can imagine blest spirits beholding with awe and joy the Creator's goodness and beauty, yet shielded from the knowledge of the existence of sin or ugliness.

§ 128. But even if the notional co-existence of opposites be without exception—as ' wise king ' implies the possibility of ' unwise king ', 'full jug' of a jug which is not full—yet truth belongs to judgements, not to notions. In the Idea opposites lie side by side

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[1] The Hegelian Absolute is really pure Abstraction, void of all reality, and also of all power or tendency to be determined in one way more than in another—otherwise the Unconditioned is subject to conditions. Pure and impure both *are*, and neither is the other. Each, if it is, also is not. The self-movement of the Deity realizes the Idea impartially in both. But this is to make not righteousness and peace kiss each other, but righteousness and unrighteousness, peace and wrath. ' Not-good ' is not not-Being determined as goodness, but Being determined as not-goodness. Everything is thought as really yes or really no ; and non-Reality, not-Being, is not a conception at all.

as opposed; but they do not interfere with one another, and so need no 'reconciliation in a higher synthesis'. Strife implies simultaneous *affirmation* and *denial*. 'Being is the other side of thought' only if by thinking we mean judging. Judgement, unlike conception, involves assertion. Now this 'I assert' is the one thing which cannot possibly be made ideal, but is always actual. 'Nothing,' says Dr. Bradley, 'excludes any other, so long as they are able to remain side by side; incompatibility begins when they occupy the same area.'[1] But contradictory statements do occupy the same area. Conflicting assertions of actuality cannot be combined in judgement.

§ 129. Though the notion XY, then, involves the notion not-XY, the assertion 'Y is X' only requires the distinguishing X-ness from qualities which are other than it. In other words, the counter-relativity of ideas as actual does not involve as true the counter-relativity of statements about reality. Indeed if every ideal combination has in the noümenal sphere a reality to correspond to it, the Hegelian system must, on its own showing, be in that sphere both true and false, since its falsity is as much a thought as its truth. Again, since the idea of the non-existence of God Himself is as much *in intellectu* as the idea of His existence, it must be noümenally as true. The confining the validity of the law of rationality to finite understandings, dealing with finite objects, results, in fact, not so much in what Mansel calls 'a gigantic scheme of intellectual pantheism' as in an incoherent scepticism. Religion especially is undermined by the resolution of historical fact into mere beauty of idea. Modern monism regards everything as good and true from a certain standpoint. Certainly, seeming oppositions of thought might find reconciliation in a wider grasp of the body and system of truth. But if two views really conflict, one must give way. Again, error may bring out truth, just as light would not be visible apart from darkness. But error and truth cannot, 'in the great chime and symphony of nature,' be the same thing. The denial of any attribution implies, no doubt, the existence of the attribute in thought—and in this sense we can say with Spinoza, 'omnis negatio est determinatio'—; but it excludes existence, as attributed to that particular subject, in reality. The eternal distinction between the True and the False is not

[1] *Principles of Logic*, p. 136.

dualistic ; for Truth has no meaning apart from the possibility of falsity. 'Not-being,' it is asserted, 'exists because it is a thought.' Is it, however, a thought, that is to say, a thought about reality ? Thought which is to agree with reality must agree with itself.

§ 130. If we are satisfied that two truths can never clash, and that the true and the untrue cannot be blended in one, we shall find practical safety, whenever a perplexing problem refuses to be untied, if we get back to something of which we feel perfectly convinced, and follow deductively the clue which it gives us. What is the logical course to take ? We need not fear that what seem to be rival claims of right and truth will really be found incompatible. If two principles or claims do undoubtedly conflict, without any possibility of reconciliation, we may be certain that one or the other is wrong.

§ 131. While the formal compatibility of two conceptions does not indicate that they are actually and empirically compatible as judgements, the formal incompatibility of two conceptions at once disproves their compatibility in fact.

§ 132. In answer to more popular objections to the Principle of Contradiction, it is of course true that predicates are often employed in a relative sense ; the same person is both father and son, both superior and subordinate. A battle or bet which is won is also lost. Weather which is bad for the corn may be good for the roots, and a pouring day is a fine day for the ducks—*il fait beau temps pour les canards*. In another sense Macbeth says, 'So fair and foul a day I have not seen.' 'Antiquitas saeculi' is 'iuventus mundi'. At a level crossing, gates open for trains are *ipso facto* closed for vehicles. Again, words like tall, loud, better, and the like, are comparative only. The robin in Rogers' poem sees a 'schoolboy's giant form '.

§ 133. Contradictory attributes, moreover, are predicable of the same subject at different times. Philip, drunk last night, is sober this morning. Tertullian said he had known 'pastores in pace leones, in praelio cervos '. It is possible to 'make a heaven of hell, a hell of heaven '.

> She sinks on the meadow in one morning-tide
> A wife and a widow, a maid and a bride.

Or they are rhetorically conjoined. St. Hilary has the bold

phrase, 'irreligious solicitude for God.' Hooker speaks of devout blasphemies, Bunyan of bold-faced shame, Laud (ironically) of an innovation of above thirteen hundred years old, Gibbon of organized anarchy, Drummond of Hawthornden of the dolorous felicity of life. Life in *Holy Dying* is called a sickly health. Elia calls his life with his sister double singleness. Horace speaks of *insaniens sapientia.* Milton accuses St. Peter of being arrogant and stiff-necked in his humility. Knox has been called a presbyterian pontiff, and Mill 'the saint of rationalism'. There may be even verbal confliction, as in phrases like 'joyless joys' (Faber), πόλεμος ἀπόλεμος, 'Beauty is most adorned when unadorned.' A subject may be qualified in opposing ways according to the point of view ; as in St. Augustine's apostrophe, 'O Pulchritudo, tam antiqua et tam nova !' Man, in the Sphinx's riddle, is four-footed, two-footed, and also three-footed. A sophomore, or learned blockhead, is wise in one sense and unwise in another. ' Fairest Cordelia, thou 'rt most rich, being poor.' The bitter-sweet apple—but *aigre-doux* in French means sourish—combines two unlike flavours. The Quietists spoke of an actively-passive state of the soul. (See §§ 48, 235 seq.)

§ 134. It is obvious, however, that in such cases a quality is not simultaneously affirmed and denied of the same subject in the same relation and in the same sense. If ever it be really so, the intention of the words is nonsensical ; like the tragical mirth enacted before Duke Theseus ; or Mistress Ford's 'an eternal moment or so '. Slender says : 'All his successors gone before him have written *armigero,* and all his ancestors that come after him may.' And Launce declares : ' My grand-dam, having no eyes, wept herself blind at my parting.' More tragically, Constance in *King John,* 'Thou odoriferous stench, sound rottenness.' The Londoner's explanation to a surprised companion on an August bank-holiday—' You see, blackberries are always red when they are green'—was ridiculous only on the surface. For other illustrations see Appendix K.

§ 135. The Principle of Contradiction is usually expressed symbolically with a singular subject : ' X cannot be, and not be, Y.' More fully, 'No YX (i. e. no X which is Y) is non-Y (a non-YX), and no non-YX (i. e. no X which is not Y) is Y (a YX).'

The Principle of Excluded Middle is stated symbolically thus:—

'X either is Y or is not Y.' 'Every non-YX is not Y; and every not-non-YX is Y.'

§ 136. But the Principles also apply to opposed *quantified* propositions, where the opposition lies between the respective quantifications, which may be regarded as the real predicates. Thus :—

A. Universal Affirmative.   All X's are Y.
E. Universal Negative.   No X is Y.
I. Particular Affirmative.   Some X's are Y.
O. Particular Negative.   Some X's are not Y.

A is contradicted by O and O by A. E is contradicted by I and I by E.   If a proposition be true its contradictory is excluded, and if untrue its contradictory must be accepted.

A and E are Contraries and incompatible.   But if the one be untrue it does not follow that the other is true. A middle between contraries is not excluded. I and O, often called Sub-contraries, may or may not be true (they cannot be untrue) simultaneously.

§ 137. A strict dichotomizing, then, yields us only three kinds of objective possibility as regards the attribution of Y to X. The first dichotomy tells us that either all X's are Y (1) or not all X's are Y.   The second dichotomy divides 'Not all X's are Y' into 'No X is Y' (2) and Some, but only some, X's are Y (3). These are the three kinds of objective possibility about the relation of Y to X.   For a verbal fourth possibility, 'Some, but only some, X's are not Y,' is really identical with (3).

§ 138. But, regarded as subjective judgements, there is a fourfold division.   For, if I judge that some X's are Y, I do not exclude the possibility of all X's being Y; and, if I judge that not all X's are Y, I am not necessarily denying that no X's are Y. τις is logically consistent with πᾶς, and οὐ πᾶς with οὐδείς. Accordingly 'Some, but only some, X's are Y' is a double judgement, though it is only a single possibility.   And the word 'dichotomy' is properly used for a logical division of judgements rather than a material division of possibilities.

§ 139. As applied to quantified propositions the Principle of Contradiction says that, if it is true that all X's are Y, it is untrue that some (any) X's are not Y; and vice versa.   Also that, if it is true that no X is Y, it is untrue that some (any) X's are Y; and vice versa.

§ 140. Excluded Middle has exactly the same formulae, substituting 'untrue' for 'true', and 'true' for 'untrue'.

§ 141. If 'All X's are Y' is meant to be contradicted by 'All X's are not Y', a heavy stress must be laid upon *all*. E. g. 'All is not lost'; 'All are not of that opinion'; 'Toutes les vérités ne sont pas bonnes à dire'; which are I propositions. But, 'All they that trust in Him shall not be destitute,' 'non est impossibile apud Te omne verbum' are E propositions.

§ 142. Again, to contradict 'Some men are sinless' by 'Some men are not sinless' is awkward and ambiguous. For contradiction, *not* would require to be emphasized. A stress upon 'some' would appear to give an A proposition strengthening the original one; 'Not some are sinless, but all.' *Some* cannot ordinarily in English be contradicted by *not some*, as *all* can be by *not all*, but only by *not any*. In Greek, however, enclitic τις is contradicted by οὔτις. οὔτινες is a rare plural form. Latin has the phrases *nullus* (*ne ullus*), *nemo* (*ne homo*), *nonnullus, non nemo*.

§ 143. We are here somewhat anticipating the application of the metaphysical Law of Consistency to the structure of human thought. But it is necessary to examine an objection to the Principle of Contradiction which Bosanquet advances. 'Apart,' he says, 'from the distinction of quantity, the difference between the logical contrary and the logical contradictory disappears.' [1] 'The tax-collector is gone.' No, he is not gone (i. e. he is here). Bosanquet calls it 'an inconvenient accident that the Law of Contradiction applies to Contraries only, while logical Contradictories come under Excluded Middle'.[2] But why adopt an unquantified formula? What is denied when a quantified proposition is contradicted is the number of objects of which the predication is asserted. Contradictory, here, cannot coincide with contrary. 'Not all' cannot be intended to mean 'none', nor *nonnulli* to mean *omnes*. On the other hand, when a judgement with a singular subject is denied, the negation qualifies, no doubt, the entire predication, so that to contradict 'The saucepan is dead' need not imply that the saucepan is alive; and yet usually the negation is considered as attached to the predicate itself. 'This cheese is palatable.' No, it is not (= un-) palatable.

[1] *Logic*, i. 311.   [2] Ibid. ii. 210.

'James went.' No, he stayed. 'He sleeps.' No, he is awake.
'The letters of the alphabet are of European origin.' No, they
are of non-European origin. (But they might have come from
heaven.) 'The Scriptures are inspired.' No, they are uninspired.
Snakes inhabit Iceland. That is a mistake. They do not
inhabit Iceland.

§ 144. Yet even in such propositions there is not necessarily
a coincidence between contrary and contradictory.[1] To deny
that the water is hot is not to say that it is cold. To deny that
knowledge is power is not to say that it is weakness. To say
that logicians are not unanimous does not imply that they are
entirely at sixes and sevens. An egg which is not good may be
good in parts. The contradiction of 'John is a harmonious
blacksmith' may certainly convey the idea that he is an unhar-
monious blacksmith. But logically it need not imply that he is
a blacksmith at all. He may be a dentist, or an infant, or play
in a German band. If it is untrue that Wellington was victorious
at Cannae, it does not follow that he was beaten there.

§ 145. A singular judgement about a past event usually admits
of no degrees of predication. The countess rose from her chair.
The countess did not rise from her chair—that is, she sat still.
But in the present tense a singular or collective judgement has
usually some abstract character—'The devil,' says Latimer, 'is
never out of his diocese'—and may be regarded as quantified.
If it is asserted—'Enough is not as good as a feast,' or 'Japan

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[1] Chrysippus' well-known catch, called *Mentiens* (for which see
Mansel's *Aldrich*, App. § 6), about the Cretans being always liars, derives
half its force from the confusion of contrary and contradictory. Epi-
menides, who said this, is a Cretan, and is himself therefore a liar. If
what he says, then, is true, it is untrue ; and accordingly Cretans are not
always liars. It is only by stating this contradictory as a contrary,
' are always veracious,' that the rest of the dilemma has any point. If
the Cretans are always veracious, Epimenides, being a Cretan, speaks
truly, and Cretans *are* always liars, and in that case, Epimenides is a liar.
And so on, *ad infinitum*. The simplest but ' most insoluble ' form of the
puzzle is this: 'I say truly that what I am now saying is untrue.' ' Si te
mentiri dicis, idque verum dicis, mentiris an verum dicis ?' (Cic. *Acad.
Pr.* § 95 ; cf. Aul. Gell. *N. A.* xviii. 2, § 10.) But where, now, does
Excluded Middle come in ? The answer is that the statement is not
merely formally self-contradictory, but formally impossible, except as
a collocation of words. ' My present words are untrue ' simply sublates
predication. It can neither be affirmed nor denied ; for there is nothing to
affirm or deny.

is not the England of the East,' or 'Westward the course of Empire does not take its way,' or 'Silence does not give consent,' what is meant to be contradicted is the too general and unqualified character of the statement denied. The proposition, 'If it is about to rain the glass falls,' is contradicted by 'Not always,' 'not necessarily.' The logical contrary would be, 'It never falls.' Material contrariety would be the assertion that under such circumstances the glass rises. Observe that the English verdict 'not guilty' means, not proved to be guilty; but the same verdict in Scotland signifies, proved to be not guilty, the Scots having a third verdict, 'not proven.'

§ 146. Logic can take no cognizance of material contrariety—black and white, up and down, thick and thin, rich and poor, and the like—unless the contrariety is given formally. It is true that under the Law of Relativity we cannot be conscious of anything except by a mental transition. We get the idea of heat by passing out of cold, of light by transition from darkness, of lightness or softness by first (even if without conscious attention to the experience) experiencing weight or hardness. But the distinction between positive and negative states is psychological rather than logical.

§ 147. It should be observed that while the universal negative 'No men are happy' is upset by a single instance, 'Caius is happy,' and the latter proposition is upset by the former, this eversion requires formally the additional statement, 'Caius is a man.' Obviously the contradictory of 'Caius is happy' is not, 'No men are happy,' but 'Caius is not happy'. And this again need not mean that he is unhappy.

§ 148. There must always be some ambiguity about unquantified propositions. 'I ought to go' and 'I ought not to go' are in truth contraries. The former is really contradicted by 'I am not bound to go', and the latter by 'I am not bound not to go'. These are the four types, *A, E, I,* and *O.*

§ 149. Talleyrand, being asked if the report of George III's death were true, replied :— 'Some say so. Others deny it. For myself, I believe neither. But this is, of course, in confidence.'

Which brings us to the consideration of the Principle of Excluded Middle.

The Principle of Excluded Middle, or Third.

§ 150. This is the Law of disjunctive reciprocity.[1] It says that two contradictory propositions cannot both be denied, as the Principle of Contradiction says that they cannot both be affirmed.

§ 151. What has been said above about confusion between contradictory and contrary opposition will guard us from the crudity of charting everything and everybody ' in coarse blacks and whites', going about the world, as it were, with a piece of chalk in one hand and a piece of coal in the other.[2] An argument is often directed against disciplinary rules that they do harm to the bad and are not needed by the good. But of the persons affected by such regulations the great majority can neither be called good nor bad, and it is these for whose benefit rules are made.

§ 152. There may in practice be no choice save in one extreme or the other. 'Aut amat aut odit mulier ; nil tertium.' A man sometimes stands betwixt the devil and the deep sea. But of contraries both may be untrue without denial of the existence of the subject or of the 'universe of discourse' (see § 158)—which is denied when contradictories are both apparently stated as untrue. ' Nec possum vivere tecum, nec sine te ' implies that I cannot live at all. Caesar says of the Gauls:—'neque tyrannum nec libertatem pati possunt.' That is, they cannot put up with

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[1] Jevons calls it the Law of Duality, and states it mathematically in the form, $A = A(B+b)$. Dichotomizing further, we get,
$$A = A (B+b) (C+c) = ABC + ABc + AbC + Abc. \text{ And so on.}$$

[2] Newman, not without reason, ridiculed the ' moderate man ' who can ' set down half a dozen general propositions which escape from destroying one another only by being diluted into truisms. . . . This is your safe man and the hope of the Church,' guiding it between the Scylla and Charybdis of aye and no. Still, there is a proportion (ἀναλογία) of the faith. The successive Church Councils have been likened to a smith hammering first on one side, then on the other, of the hot iron, not so as to produce a negative and neutral result, but so as to shape a well-balanced sword of the Spirit. In life and practice 'he that is not with Me is against Me'. But in speculative thought there is a danger lest one too emphatic doctrine should exclude others, no less vital. For scientific fullness Christianity needs, not a mere ' live and let live' of unrelated and fragmentary 'views ', but a unifying and subordinating of partial and sectional aspects of truth in the *Fides Catholica.*

any form of government whatsoever. So Wellington declared that his army was a rabble which could bear neither success nor failure.

§ 153. Bosanquet writes :—' According to the traditional rule a statement may be so denied that both judgement and denial are false.' [1] This is inexact. A judgement and its contrary may both be false ; but a contrary is denial and much more. Now it is the ' much more ' which is untrue, not the denial.

§ 154. This *principium exclusi medii, aut tertii, inter contradictoria*, which Bain considers to be 'too much honoured by the dignity of a primary law of thought', has been exhibited above as only the other side of the *principium contradictionis*. Yet it is much more obvious that a given predicate cannot be both affirmed and denied of a subject than that it must be either affirmed or denied. Is it the case that every possible judgement must be either true or false ? Aristotle says explicitly :—μεταξὺ ἀντιφάσεως ἐνδέχεται εἶναι οὐθέν, ἀλλ' ἀνάγκη ἢ φάναι ἢ ἀποφάναι ἓν καθ' ἑνὸς ὁτιοῦν.[2]

§ 155. No subject stands out of relation to any predicate, but must stand in one of two mutually destructive relations to it. Everything must be affirmed or denied of everything.[3] ' Every real,' says Bradley, ' has a character which determines it with reference to every possible predicate.' [4]

§ 156. Mill, however, with many other writers, maintains that this Principle is only true with a large qualification. We can only say that every assertion must be true or untrue where 'the predicate is one which can in any intelligible sense be attributed to the subject . . . " Abracadabra is a second intention " is neither true nor false. Between the true and the false there is a third possibility, the Unmeaning.' [5] Bosanquet also seems to hanker after the forbidden mingling of formal and material, and to argue that two contradictories may both be false, *if non-significant*. But this is really the question already discussed of the coincidence of contradictory and contrary. A friend is either faithful or unfaithful ; but an attitude or a stick of chocolate need not be.

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[1] *Logic*, i. 209.
[2] *Met.* iii. 7 ; cf. *An. Post.* i. 11.
[3] ' Oportet de omni re aut affirmare aut negare ' (Goclenius).
[4] *Principles of Logic*, p. 143.
[5] *Logic*, i. 321. Mill cannot mean ' is a noun of the second intention ' (*suppositio materialis*), which would not be a meaningless proposition.

A line which obeys a regular law if it is not straight is curved ; but this is not true of digestion or philanthropy.   Two straight lines either meet or are parallel, but not two lumps of sugar.[1] All, however, that our Principle says is that if it is not true that digestion is a straight line, &c., it is untrue, and if it is not untrue it is true.

§ 157. Veitch, in the same way, contends that much misconception has arisen regarding the law of Excluded Middle, from supposing that it warrants 'a universal comparison of any possible subject-notion with any possible predicate-notion, and that the predicate must either inhere or not inhere in the subject.'   'This,' he says, 'is irrelevant and puerile.   In accordance with the essential nature of logical law it supposes a definite subject with its definite sphere of at least possible predication.'   He defends Hamilton from the charge of advancing this puerility, and meets Hegel's objection to the Principle that it does not distinguish between partial and total negation, requiring us to say, e. g., that Spirit is either green or not green, by the remark that 'the Law does not prescribe playing with predicates, but assumes that people are reasonable beings and in earnest in their inquiry '.[2]

§ 158. *La raison est pour les raisonnables.*   But what has the logician to do with play or earnest, or with anything but the actual value of a proposition as a proposition ?   And what can he know about ' definite spheres of possible predication ' ?   He is something else than a logician if he goes outside the formal connexions of the *data* supplied to him.   No doubt, if it is understood that a particular system of things—what De Morgan, Boole, Bain [3] and others call a universe of discourse—is being

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[1] ' The postulate in question is an absolute affirmative between two or more positive and significant members' (Bosanquet, *Logic*, ii. 211). Again :—' How can a universal prescribe a relation between itself and a content which falls wholly outside it and is absolutely disparate and alien to its nature ?   Where there is absolutely no connexion, it is impossible for denial to be intelligible ' (Ibid. ii. 110).   But he rightly rejects the ' negatively infinite ' judgement, as though not-hotness, the quality of not being hot, *apart from any question of temperature*, were in itself a predicable attribute (predicable, e. g. of monthly wages or the peerage or troy weight).   'Significant negation is intelligible within, and with reference to, a system judged to be actual ' (i. 306).

[2] *Institutes of Logic*, pp. 124, 125.

[3] *Logic*, Pt. I, p. 195.

spoken of, in that case a negative term acquires a positive significance.[1] Thus, if nationality be in question, non-English must mean foreign. A driver who is said not to be sober must be to some extent tipsy. A day which is not bright must be more or less dark. A paint which is not of one colour must be of another. A story which is not credible is incredible. A feat which is not possible is impossible. A watch which was once started and is not going must have stopped. A door which is not open at all must be shut. Bain, however, speaks as though such implication were independent of the particular area of discussion, and asserts that 'the negative of a real quality is as much real as the positive,'—instancing north and south, hot, cold and tepid. Handwriting cannot be said to be either hot, cold or tepid. Therefore the Principle of Excluded Middle is at fault. Bain is clearly wrong. Most statements have an understood, or given sphere. If promotion cometh neither from the east, nor from the west, nor yet from the south, it must (as the eighteenth-century placeman suggested) come from the (*sc.* Lord) North. 'If it comes from anywhere,' *subaudito*. Against the Puritan contention that no practice of a Church in error ought to be followed, and that Greeks and Latins were both in error, Hooker pointed out that in the Eucharist the Greeks use leavened, and the Latins unleavened, bread. Now bread must be either leavened or unleavened. Had the Puritans rejected the 'breaking of bread', Hooker's argument would have been pointless.

§ 159. After all, we can never tell what propositions, as lacking a universe of discourse, are meaningless. 'The Torrid Zone is not a fellow of a college' sounds nonsensical enough. Yet Caligula's horse nearly became consul, and some pocket-boroughs, it has been said, would have returned their owner's riding-whip to Parliament, if so bidden. 'Tithonus is not mortal.' Is he then immortal? But Tithonus may be a hill or a diamond. And the practical identification, where the universe

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[1] We cannot, however, say that a non-voluntary action is involuntary if we accept Aristotle's distinction between οὐχ ἑκών and ἄκων (*Eth. N.* iii. 1, § 13, and 1110 b 18). Similarly a non-rational act is not necessarily irrational, nor a non-moral act immoral. Is peace merely not-war? But Spinoza says:—' Peace is not the mere absence of war, but a virtue which springs *ab animi fortitudine* ' (*Tract. Pol.* v. 4).

of discourse exists, between contradictory and contrary, is always liable to some error. A town in this island which is not in England might be confidently affirmed to be in Scotland if one knew nothing about Berwick-upon-Tweed.

§ 160. There can be no possible exception taken to the Principle of Excluded Middle if it be observed that it can be worded so as to be actually tautological. ' Either . . . or ' signifies, ' if not the one, then the other.' We thus lay down that if a proposition be not true (even though it be just not true) it is untrue, and if it be not untrue it is true. Or, if the words ' true ', ' untrue ', ' false ' are thought to suggest that the proposition has an intelligible meaning, it might be better to say,. ' If it is not the case that Abracadabra is a second intention, it is not the case.' Or, ' If a five-act tragedy is not otherwise than tedious, it is tedious.' Or, ' If yellowness be not predicable of patriotism, it must not be predicated of it.'

§ 161. The force of the Principle is, however, clearer when quantified propositions are opposed. If it is not true that all X's are Y, it must be true that at least some X's are not Y; and vice versa. And if is not true that no X's are Y, it must be true that at least some X's are Y; and vice versa.

§ 162. The Principle of Contradiction is confronted with a metaphysical problem, that of Change or Becoming, which, it is contended, involves a union of being and not-being in the same object at the same moment. ' At the same moment,' however, begs the question. It is, no doubt, difficult to analyse the idea of *becoming*, but that is because it is difficult to analyse the idea of the efflux of time. When *now* can be shown to be simultaneous with *just now*, we shall be ready to agree that *quod nunc est* is identical with *quod fuit modo*.

§ 163. Excluded Middle also has a metaphysical difficulty to meet, in the case of propositions such as those relating to Space, Time, or Free Will, which we can neither conceive to be true nor yet untrue. Space is bounded. Space is unbounded. Time had a beginning. Time had no beginning. The will is free. The will is not free. But conceivability is not a test of possibility; and in these matters the mind is so wholly out of its depth that we are not called upon to say which of the two contradictories, both inconceivable, is true and which false. But

one or the other must be false.[1]   Here again the Reason is not the Understanding.

§ 164. The 'Fallacy of Many Questions' would not embarrass any one if it were remembered that in every proposition there can be only one logical predication, and that it is this, and nothing else in the proposition, which has to be admitted or denied.[2]   In the time-honoured example, 'Have you ceased beating your father?' *ceased* is the real predicate, and he who has not begun can truly say that he has not left off.   Any sophistical inference drawn from my 'No' would be at once disallowed by a dialectical referee.   Asked, 'Does this diamond sparkle?' I may answer 'Yes', without being taken to admit that the object pointed to is a diamond.   'This diamond' means 'this thing which I, or you, call a diamond'.   Indeed, all demonstrative pronouns, and the definite article too, are question-begging.   'Our able chairman remarked'—'This eligible mansion is to let'—'The turtle soup is ready'—here *able, eligible* and *turtle* are negligible assumptions.   The same is the case with merely epithetical additions—'Good Queen Bess,' 'perfide Albion,' 'rural Hampstead,' 'glorious liberty.'

§ 165. 'Other' is with us a question-begging word—'he and other criminals.'   'He and *the* other criminals' begs two questions.   But the Greeks spoke of 'horses and other cows'.   Again, if asked, 'Is your objection merely one of sentiment?' I may reply 'Yes' or 'No' without admitting the innuendo conveyed by 'merely'.   'Only', said in a particular tone, suggests a like disparagement.   Interrogations beginning *Why?* assume the fact for which an explanation is demanded.   'Why,' a Scotsman was asked, 'do your countrymen always reply to a question by asking one?'   'Do they?' he returned.   Other interrogative particles likewise.   'Where is the stolen money?'   'Which overcoat shall you wear?'   'When did he die?'

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[1] It should be remembered that to deny commencement to Time or a limit to Space is not necessarily to affirm the eternal pre-continuance of the one or the infinite extension of the other.   In the Kantian view Time and Space are subjective.

[2] It may happen that the negations of a protesting attitude of thought will be true as denials, and yet the system in which a breach has been thus effected be nearer to the truth than the negative and merely pro- testant scheme which sets up a rival claim to it.

'How long were you away?' 'Whither will you run?' Dis-
junctive questions, again, seem to imply that one of the alter-
natives must be true, as, 'Did you get tipsy on port or on
claret?' The predication lies in every sentence where the
stress falls—so that false stress is the converse fallacy to the
fallacia plurium interrogationum—, and in such a disjunction
there is a double stress, e. g. 'Which did sin, this man or his
parents, that he was born blind?'

§ 166. The conjunction 'and' often lays a trap. 'Is she
young and thoughtless?' 'Will you be charitable and lend me
another twenty pounds?' But the same fallacy of assumption
takes many interrogative shapes. 'Are you so base as to ask
me to repay that small loan?' 'Do you wish me to act as
wrongly as you did?' 'Am I to fall in with such a whim?'
And so forth.[1]

§ 167. The doctrine that every question admits of a categorical
answer, and that every proposition can, and must, be rationally
affirmed or denied, will be found, when Modal Propositions are
discussed, to preclude any modification of the so-called Copula.

§ 168. From the axioms of Excluded Middle and Contra-
diction proceed respectively the force of the Dilemma and its
danger to its propounder. If an opponent is bound to accept
one of two alternatives, the consequences of which are alike dis-
agreeable to him, he may retort that, as mutually contradictory,
they cannot both be true, and that the horn of the dilemma on
which he is not transfixed pierces the proponent of it, who has
thrown away the advantageous consequence to be inferred from
the one alternative or the other. If A is B, C is D; and if A
is not B, C is D. Therefore either way C is D. Yes, he
rejoins, but you cannot have it both ways. One line of argu-
ment or the other is closed to you. A fuller form of the
Dilemma is this: If A is B, C is D; and if A is not B, E is F,
both consequences being distasteful to me. But I retort: A
cannot both be and not be B. If the former is false, C is not

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[1] The difficulty of asking any question which does not either involve
a disputable assumption, or else another interrogatory inside the first, is
shown by the confused issues which almost invariably arise out of a demo-
cratic *referendum*, even when, as in Switzerland, most carefully drawn.
The result of a recent educational *referendum* in Australia was claimed by
both sides as a victory.

(shown to be) *D*, and if the latter, *E* is not (shown to be) *F*. Such a rebutter is, as the words in brackets indicate, weak formally, but in practice may be very damaging. In the famous fresco in the Spanish Chapel in the cloister of Santa Maria Novella at Florence 'Logic' holds a scorpion with a double sting, signifying dilemmatic argument.

§ 169. The complaint, 'If *A* is *B*, you say that *C* is *D*; and if *A* is not *B*, you still say that *C* is *D*,' is formally illogical, for an effect may have several causes. But when there is a close connexion between consequent and antecedent, there may be force in it. The following are all in the same form, but not equally forcible as objections :—

(1) If I die you say the sun will rise to-morrow, and if I do not die you still say it will rise.

(2) If I confess I am to be punished, and if I do not confess I am to be punished.

(3) Mihi, errato, nulla venia, recte facto, exigua laus (Cic. *de Leg. Agr.* ii. 2).

In the following, again, the paradox depends on the material connexion between learning the truth and distress of mind. Cicero says :—'O miserum te si intellegis, miseriorem si non intellegis.' One would have expected that *only* by hearing the truth would pain arise; in other words, that in this case consequent and antecedent might be presumed convertible.[1]

§ 170. Horace's line, 'Sume, catelle; negat. Si non des, optet,' is of the form—'If *A* is *B*, *C* is not *D*; and if *A* is not *B*, *C* is *D*.' At first sight there is nothing to criticize in the alternative consequences. 'If rain falls, I do not leave my umbrella at home; if it does not fall, I do.' But the umbrella is taken at one time and left behind at another. Whereas in, 'Say, Take it; he won't. Do not offer it, and he will long for it,' the point is that at (practically) the same moment he pretends to want and not to want it. For further discussion of Dilemmatic Reasoning, see below, §§ 966 seq.

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[1] So in 1 *Henry IV*, i. 2 :—

Poins. Jack, how agrees the devil and thee about thy soul that thou soldest him on Good Friday last for a cup of Madeira and a cold capon's leg?

Prince. Sir John stands to his word ; the devil shall have his bargain. For he was never yet a breaker of proverbs; he will give the devil his due.

Poins. Then art thou damned for keeping thy word with the devil.

Prince. Else had he been damned for cozening the devil.

CHAPTER VI

THE AXIOM OF PERSISTENCY

§ 171. THE two-sided Axiom of Consistency, or Doctrine of Contradictories, as above set forth, is negative and regulative. It prohibits the uniting of formally incompatible attributes, either ideally in the Concept or assertively in the Judgement. On the side of Excluded Middle it takes, it is true, an affirmative form, compelling us to judge, if a thing is not somewhat, that it is its contradictory.

§ 172. But this would not, in itself, have given us Inference through a Middle Term. No doubt, if a conclusion which is inconsistent with its premisses is attempted to be drawn, or a conclusion which ought to be drawn from given premisses is denied, the Axiom of Consistency can disprove the one and prove the other by a *reductio ad absurdum*. That any or all of the S portion of the M's should not be P when every M is P is impossible. But to argue thus the constructive principle of the syllogism has to be assumed. Syllogistic law has been established by employing the syllogistic process.

§ 173. Again, it may seem that, a wrong conclusion being shown to contradict the premisses, its contradictory, the right conclusion, is then reconstitutively established by the Principle of Excluded Middle. But this is not so when the disallowed conclusion more than contradicts the premisses. Thus, Every X is Y, every Y is Z; therefore no X is Z. We cannot by showing this to be a wrong conclusion get the right one, Every X is Z. Further, the Law of Consistency is powerless to expose a mere *non-sequitur*. X is Y, Y is Z; therefore Q is R. 'No wonder,' said the traveller, 'this place is called Stony Stratford. I was never so bitten by fleas in my life.' Or, X is Y, Z is Y, therefore Z is X. Or, X is Y, Z is not X, therefore Z is not 'Y. Here are three conclusions from the fact that fishes live in the water, (1) false, (2) and (3) true, but all *non-sequiturs* :—

(1) Whales live in the water. Therefore whales are fishes.

(2) Herrings live in the water.   Therefore herrings are fishes.

(3) Cats are not fishes.   Therefore cats do not live in the water.

§ 174. We seem, therefore, to need a complementary Axiom, not merely a conditioning of thought by the exclusion of inconsistency, but a positive, constitutive, directive, and actively compulsive Principle of rational consequence.

§ 175. The Principle of Identity has been generally regarded as only another way of stating the Principle of Contradiction. If a statement is true it is true, and if it is true it is not untrue. As a judgement which is contradictory must be denied, so a judgement which is identical must be affirmed.   Accordingly the Principle of Identity—though Mill calls it 'our ancient friend'—was ignored by all philosophers till Andreas, who died in 1320.

§ 176. Identity, however, is no mere repetition of the subject in the predicate.   It asserts the perdurance of the one in the many, of form in matter, of the abstract in the concrete, of the rule throughout its applications, and of the principle in every manifestation of it.   I venture to call this complementary axiom the Axiom of Persistency.

§ 177. Hamilton's statement of the Principle of Identity as 'A is A' or '$A = A$' ('everything is equal to itself')[1] has been not unfairly termed a lifeless branch, an unfruitful truism based on a false theory of conception.[2]   If 'everything is itself' means that a thing is identical with its own nature or attributes, judgement becomes a mere equivalence, if it is even that. 'The Concept,' Hamilton explains, 'is equal to all its characters.' $Z = (a + b + c)$. But conceptual reasoning is not, '$A = A$, $A = A$, therefore $A = A$.'   Nor is it even '$A = B = C$, therefore $A = C$'.   But it is, 'A is a B, every B is a C; therefore A is a C'—though this is not the only way of expressing the formula.   And, as against the Hamiltonian view of predication, it will be contended here that,

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[1] *Lectures on Logic*, i. 80.

[2] 'All judgements to be absolute,' says Lewes, 'must be identical' (*Hist. of Phil.* ii. 463).   But he uses 'identical' or 'equivalent' for primary judgements of sensations and for necessities of thought (see i. p. lxii).   On the other hand he writes :—' No propositions are true unless identical' (ii. 541)—that is, I suppose, unless reducible ultimately to an immediate perception and an axiomatic principle, or the former alone. But a mere consciousness of sensation is not yet a judgement.

except where the major premiss is an analytical judgement, the content or meaning of a Concept, its equivalence to the sum of its essential and constitutive characters, does not enter into reasoning. If I say, 'This plate is valuable (or breakable) because it is a piece of old Nankeen,' or 'This child must pay full fare because he is over twelve', I am not arguing from the meaning of concepts but from circumstances which I or others happen to know about things.

§ 178. The 'omne subiectum est praedicatum sui' of Aquinas, or the saying, 'Nothing can be predicated except of itself,' attributed first to Euclid of Megara, does not express the import of the proposition. Unless we can find more in the predicate than in the subject, 'Abracadabra is Abracadabra' is not a judgement, and really asserts nothing. Even the claim to be allowed to repeat the same thing in a different form of words, though Mill declares that the Principle of Identity is thus made to 'mean much more than it ever meant before ',[1] cannot rank as a logical postulate, since it must first be stated that the two sets of words are equivalent, and this knowledge is given materially, not formally.

§ 179. Assertion is an ideal synthesis, a real amplification of the subject by the predicate ; and identity which excludes difference is tautology without a meaning.[2] Such a theory of Thought, resting on atomism, on a metaphysical egalitarianism, destroys Thought. Seeing this, Bosanquet states the Principle in the form, not $A = A$, but A is AB. A tailor is a tailor kind of man. I prefer the formula, BA is A. A does not cease to be A when conditioned by, and manifested as, B. A journeyman tailor is a tailor. A suffragan bishop does not the less exercise the episcopal office because he is a suffragan. A Cambridge undergraduate has not yet taken his degree, because no undergraduate has. A does not cease to be what it is, to have its proper attributes, when it is this, that or the other kind, or example, of A. Thus we get the Syllogism. If A is $(a+b+c)$, BA is $(a+b+c)$. Of the B sort of A's we must predicate whatever we predicate of A generally. If ill weeds grow apace, it does not matter what variety they are of—nettles, docks, buttercups. They all grow apace.

[1] *On Hamilton*, p. 481.

[2] See Bradley, p. 131, and Bosanquet, i. 357 and ii. 207.

§ 180. Bosanquet observes :—'We can only assign a meaning to the law "*A* is *A* " if we take the repeated *A* not to be a specification of the identical content, but an abstract symbol of its identity. The law will then mean that in spite of the differences expressed in a judgement, the content of judgement is a real identity, that is to say, has a pervading unity. It says that there is such a thing as identity in difference, or, in other words, there is such a thing as genuine affirmation. . . . The Law of Contradiction simply confirms and reiterates that assumption of the unity of reality which the Law of Identity involved. You cannot play fast and loose with Reality. What is true at all is true throughout Reality.' [1]

§ 181. The element of continuity which persists through differences supplies that stability of ideal content which guarantees the connexions of thought and enables us to reason about things. Difference is essential to a real judgement—even if it be an identification [2] or definition. Though thought of in various connexions and at various times, that of which we think is throughout what it is ; for reality or truth, correlated as it is to the unvarying self-consciousness of the judging Ego, is out of relation to spatial and temporal conditions.

§ 182. No doubt, inference through identification of singulars or of aggregates is the same logical process as inference through a concept or universal. ' The person buried to-day was the Lord Chancellor. Lord *X* is the Chancellor. Then it was he who was buried.' Syllogisms in the Third Figure (see below) with a singular middle term are common. 'This glass is broken. This glass cost five shillings. Then something costing five shillings is broken.' ' Mr. —— is dead. Mr. —— was a good man. A good man, then, is dead.' But even in an algebraic equation there is an ampliation of judgement ; and '$(a+b)^2 = (a+b)(a+b) = a^2 + 2ab + b^2$; therefore $(a+b)^2 = a^2 + 2ab + b^2$' is an inference which is really mediated through a universal element.

§ 183. Verbally identical propositions, such as 'Les affaires sont les affaires,' or Caesar's, 'Death will come when it will come,' have been shown above to be, if serious, real judgements, containing an extension of idea. If they are not, they are merely

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[1] *Logic*, ii. 208, 210.
[2] 'What's yonder floats on the rueful, rueful flude?
    What's yonder floats ? O dule and sorrow !
'Tis he, the comely swain I slew
    Upon the duleful Braes of Yarrow !'

nonsensical and on a par with those of the Clown in *Twelfth Night*:—' As the old hermit of Prague, that never saw pen and ink, very wittily said to a niece of King Gorboduc, That that is, is ; so I, being Master parson, am Master parson. For what is *that* but *that*, and *is* but *is* ? '[1]

§ 184. Identity implies abstraction. The pure Concrete, the unrelated sensation, cannot be conceived, known or named. Even the τόδε τι persists through differences. ' Whatever exists in time at all has some permanence, and whatever has permanence at all has existence in time. And since time is infinitely divisible, what exists in time is necessarily an identity in diversity, namely, of change (succession) in time. One cannot conceive anything which does not to some extent perdure, and thus exist as a unity in diversity.'[2]

§ 185. ' The term Identity cannot be applied to an idea which is quite simple and occurs only once. I cannot even recognize the identity of something which remains absolutely the same, unless I am aware that I have thought of it at different times and compare the recurring ideas. . . . [Logical] identity is either complete or not at all. It has no degrees.'[3] ' Carlo barked just now.' But barking is a familiar concept in my mind ; and the name Carlo suggests to it a number of images and memories—the long-haired creature ; the children's pet ; the prize dog ; the animal that lies before the fire ; my companion in yesterday's walk. So again, ' The games are done and Caesar is returning.' Every subject has successive moments in the memory or in significance, if not in time or space. We shall see later how difficult it is to distinguish concrete from abstract propositions. No doubt, a name or a presentation to consciousness conveys much more to one mind than to another. To one observer a primrose by the river's brim is a yellow primrose and nothing more ; to another it is a chalice of sweet thoughts. But its necessary self-identity as permanently supporting its own attributes, whether known or unknown, is the same to both.

[1] Compare Moses' cheerful admission to Squire Thornhill that ' whatever is, is ', and invitation to make the most of it. Another of Shakespeare's clowns cloaks in various phrases mere repetition in thought, instructing his fellow that ' an act hath three branches: it is to act, to do, and to perform '.

[2] E. E. Constance Jones, *Elements of Logic*, p. 189.

[3] Sigwart, *Logic*, i. 84, 85.

§ 186. Truth means that a statement once made does not straightway vanish elusively into air, but falls under laws and submits to rational treatment. Whatever is implied in an assertion is equally true with the original assertion. Whatever is, is. This is seen not to be a sapless ingemination if we lay stress on *whatever* and on the second *is*. *Whatever* is *A* is *A*. Any object whatsoever which is included in the class *A* (which bears the name *A*, has the attribute of *A*-ness) possesses all the attributes attributable to *A*. Whatever has a quality has every quality that goes with that quality.

§ 187. This basis of Syllogism is sometimes stated as though all propositions were analytical. It is enunciated in some such form as this, that everything which shares the common name *A* is whatever is *implied* in being *A* ; or that all the attributes which a name *connotes* are predicable of every object which that name denotes ; or that the whole extension of a name possesses the whole *intension* of that name. The 'intension', 'connotation', 'implication' of a name can only signify its *meaning*, the content of the concept when analysed. But if we infer that a spaniel is liable to a tax of seven and sixpence, because it is a dog and all dogs are so liable, we do not suppose that bringing seven and sixpence to the Exchequer is part of the analysis of the notion of dog. English letters below 4 ozs. in weight go for a penny. Therefore the letter I have written will do so. But the going for a penny, while it is a circumstance known to me about letters of a certain weight, is assuredly not what that expression connotes or means. Whatever is the intension of a predicate name is directly predicated by the judgement. 'John is a baker' tells me that John bakes. But any further circumstance that is known about bakers, e. g. that they are bound by law to carry scales, has to be conveyed in a further judgement, and can only be predicated of John by help of a syllogism.

§ 188. Sigwart seems to misapprehend the bearing of Identity on inference when he says :—'It is only when an attempt is made to base the Syllogism entirely upon the so-called Principle of Identity—*when therefore the premisses are purely analytical propositions*—that the syllogistic process seems to be without value.' [1] The identity which runs through a syllogistic construction has nothing to do with any analytical character the

[1] *Logic*, i. 362.

premisses may possess. The force of the reasoning, as reasoning, would not be in the smallest degree strengthened by their being analytical or identical. On the other hand it is not clear why Sigwart says it would then be 'useless'. Take the following double syllogism :—

Socrates *is* a philosopher ;

Philosopher *means* one who pursues wisdom for her own sake;

Pursuing anything for its own sake *implies* disinterestedness :

Therefore Socrates is disinterested.

The reasoning here is just as useful as if each premiss had been a synthetic proposition, and we had been told that philosophers marry unwisely, or do not pay their rent.

If *A* is *B*, *A* is all that *B* is,[1] or means. In Aristotle's words :—ὅσα κατὰ τοῦ κατηγορουμένου λέγεται, πάντα καὶ κατὰ τοῦ ὑποκειμένου ῥηθήσεται.[2]

§ 189. The subject of a non-analytical proposition is primarily regarded as in extension—it is the object or objects to which the subject name applies that are spoken of—, the predicate as in intension—it is the attributes implied by the predicate name which are ascribed to the subject ;[3] e. g., 'Old shoes need

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[1] A friendly critic writes :—' Is it true that, if man is animal, man is *all* that animal " is " ? Any triangle is either equilateral, isosceles, or scalene. An equilateral triangle is a triangle. It follows that it is equilateral, isosceles, or scalene.' But this is the *disiunctio ambigui* discussed below under Disjunction. What is meant by ' any triangle ' ? The *either . . . or . . . or* cannot mean that every actual triangle has an undetermined character : no triangle can exist, actually or ideally, until its character is determined. There is a *subjective* and *problematic* uncertainty in our minds *beforehand*. But directly the minor term is given as equilateral, the doubt disappears. *Triangularity* is objectively equilateral, isosceles, or scalene. But triangularity is not the middle term.

[2] *Cat.* iii. 1.

[3] Intension (Comprehension, Connotation) is not all that a thing is, but all that a name means. It is the attribute or attributes connoted by the common designation ; or rather the name's relation to the attributes. Strictly speaking the *meaning* of a name is that which marks it off and differentiates it from other names, and is therefore the same thing as its definition. Yet not all qualifications which are sufficient to define or mark off ought to be regarded as the meaning of a name—e. g. 'A barrister is a man who wears wig and gown '; ' A Jew is a Semitic who eats no bacon.' Psychologically, intension precedes extension ; the adjective (sensory perception) precedes the substantive—blue and cheerful come not only before blueness or cheerfulness, but before blue or cheerful object. Yet it was experience of this and that blue object which gave the sensation

mending.' I am thinking of old shoes as a class of things and the need of mending as a circumstance or quality to be predicated of that class. Every significant term has necessarily both aspects. 'Old shoes' suggests certain characteristics, and things that need mending form a class of objects. But the other is the primary significance. (See below, §§ 644 seq.)

§ 190. It follows that in the syllogism the middle term is naturally regarded from the point of view of intension in the minor premiss, where it is the predicate, and of extension in the major premiss, where it is subject. (To avoid confusion we are confining ourselves to the First Figure.) All A's are B, and all B's are C; therefore all A's are C. Because A's, as a matter of fact, have *all the B qualities* (every quality connoted by the name B), they have necessarily every quality or circumstance belonging, as a matter of fact, to objects generally which have the B qualities. In this case C-ness is such a quality or circumstance. Therefore all A's are C.

§ 191. But the predicates may be regarded from the point of view of extension.[1] Then, all A's are part of the class B, and

of blueness. Once, however, the universal is named, every similar object will be given that name; and thus connotation precedes denotation; for the name's intension is known, but the class's possible extension is unknown. The latter is conditioned by the former. See Sidgwick, *Use of Words*, pp. 245 n., 248.

[1] The simplest forms of statement are, for Extension—'Class X (all or some) is part of class Y, and class Y is part of class Z; then class X (all or some) is part o class Z.' And for Intension—'Z-ness goes with Y-ness, and Y-ness (always or sometimes) goes with X-ness; then Z-ness (always or sometimes) goes with X-ness.' By A going with B it is not meant to be implied that B necessarily goes with A. As, however, this means that A can 'go' without B, whereas we had just said that it goes with B, 'goes with' had better, perhaps, be 'accompanies'. Less ambiguously still—'Where X-ness is found Y-ness is found, and where Y-ness is found Z-ness is found; then,' &c. Or, 'X-ness carries with it Y-ness,' &c.

The simplest form of the Analytic Syllogism is this—'X-ness implies Y-ness and Y-ness implies Z-ness; then X-ness implies Z-ness.' Yet the statement might be in extension; e. g. 'A burglar is *ipso facto* a criminal, and a criminal necessarily belongs to the dangerous class; therefore,' &c.

To express intensive *inclusion*, the ordinary Syllogism must be stated, in full, thus—'The attribute *connoted by* the name Z is among the attributes *belonging to* things which have the attribute *connoted by* the name Y; and *those attributes* are among the attributes *belonging to* things which have the attribute *connoted by* the name X; then,' &c.

the class *B* (all *B*'s) is part of the class *C*. Therefore all *A*'s are in the *C* class. *A part of a part is a part of the whole.* This, the *dictum de omni et nullo*, Hamilton speaks of as 'constituting the one principle of all Deductive reasoning'.[1] We shall see here-after, however, that he has an illegitimate use for it, making 'All *A*'s are *B*' to mean that *B*-ness is part of the *notion* of *A*.

§ 192. Regarding subject and predicate as cause and effect, the Rule has been stated (e. g., by Alanus of Clairvaulx) thus :— *Quicquid est causa causae est etiam causa causati.* Water quenches thirst. Whatever quenches thirst allays fever. Therefore water allays fever.

§ 193. To glance for a moment at the other great syllogistic Figure, the Second, the subject and predicate of the conclusion seem naturally to be regarded as classes. *A*'s have a certain characteristic, *B*, which *C*'s have not. It follows that the classes *A* and *C* are distinct. No *A* is a *C*, and no *C* is an *A*. But the mind's interest might be different. The attributes *A*-ness and *C*-ness are never found united in the same subject.

§ 194. The Principle under discussion, then, is the foundation of the Syllogism, and is the reason, consequently, of that search for middle terms, that endeavour to detect the abstract one in the concrete many, that demand for a universal element, which is called Induction. Why is *S P*? Because it is *M*, and *M* is always *P*.

§ 195. Mill asks what we learn ' by being told that whatever can be affirmed of a class can be affirmed of every object con-tained in the class. The class *is* the objects contained in it ; and the *dictum de omni* merely amounts to the identical proposition that whatever is true of certain objects is true of each of those objects. If all ratiocination were no more than the application of this maxim to particular cases, the syllogism would indeed be, what it has so often been declared to be, solemn trifling.'[2]

We no longer suppose, he urges, that a class or universal is an entity *per se*, or anything more than a common name for the individuals which compose it. But this is the baldest no-minalism. Mill talks himself of *applying* a maxim to particular cases. Was it known to be true of all the cases before becoming a maxim ? Salt is wholesome. Wine intoxicates. Soldiers

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[1] *Lectures on Logic*, i. 145.   [2] *Logic*, i. 234.

must obey. The two former propositions might be learned by a chemical analysis. The third by considering what soldiers are for. Mill cannot mean that before stating them we must have made proof of every existing, or possibly existing, ounce of salt or bottle of wine, or considered separately the individual duty of every soldier enlisted or who might at any time throughout all the ages enlist! What can be more perverse, then, than to maintain, in effect, that a generalization, law, rule, principle or maxim does not need to be applied because 'the class is the objects contained in it'. By a soldier hesitating about his duty the general principle 'It is the duty of soldiers to obey' is remembered usefully because it is a principle, and not a mere recapitulation or summary of a number of individual cases of duty, his own included. 'The Scripture bids us fast; the Church says *now*.' It would be indeed a feeble marking of time if 'quicquid valet de omnibus valet etiam de singulis' meant that what is true of certain objects severally and individually is true of each of those objects singly and one by one.

§ 196. To state the Principle of Identity in yet one more light, it is this, that we necessarily think everything as abiding as it was in its nature and circumstances until some, not change but, *cause of change*, occur to modify it. It is not—

> Old Pillicock sate on a grassy hill;
> And if he's not gone he sits there still,

but—

> In my faith and loyalty
> I never more will falter;
> And George my lawful King shall be—
> Until the times do alter.

So in the *Winter's Tale*—

Camillo. They that went on crutches ere he was born desire yet their life to see him a man.

Archidamus. Would they else be content to die?

Camillo. Yes, if there were no other excuse why they should desire to live.

§ 197. Nothing can alter, vary, or be different without a sufficient reason. While the *conditions* of a thing remain what they were, the thing will remain what it is. 'Truth,' observes Bradley, 'does not depend upon change or chance. What is

true in one context is true in another. . . . Every judgement, if it really be true, asserts some quality of that ultimate real which is not altered by the flux of events.'[1] Achilles absent is Achilles still. Pigmies are pigmies still, though perched on Alps. 'Simia simia est, etiamsi aurea gestat insignia.' I recall a phrase in the *Holy Dying*: 'A coffin is a coffin, though covered by a pompous veil.' Rousseau taught that every human being possessed of reason possesses an inalienable sovereignty; but this did not prevent the National Assembly from disfranchising women. The logician, of course, does not deny that circumstances alter cases. All he postulates is the change of circumstance. Things are not all a casual and shifting fortuity. Truth does not at once slip through our fingers. Xerxes acted on the Principle of Identity when he counted his vast host by making it pass through pens of ascertained size—though, to be sure, there might be burly and lean nations in it. A bank cashier acts on it when he pays out a required number of sovereigns by weight rather than by tale. Rules have exceptions. Cowper says :— ' A fool must now and then be right by chance.' But that is only to say that the rule has been stated in too unqualified a way, and without allowing for counteracting causes. The parallelogram of forces in Mechanics may result in an equilibrium. Yet the law of each force has had its full effect. Strychnine poisons dogs ; yet on certain constitutions it acts as a tonic. In spite of possible Yahoos we describe mankind as rational. We do not hesitate to say that lions are savage because they have left deer unmolested when seeking common shelter from some cataclysm, or because in a millennial state they will couch with lambs.[2]

§ 198. The comparatively simple case of intermixture of physical effects may be studied in Mill's *Logic*, i. 518 seq. It must be understood that a *tendency* does not mean a law which sometimes operates and sometimes does not ; for all laws, so far as they are laws, always operate. The word merely indicates the liability to counteraction. Mathematical laws cannot be counteracted. And the higher spiritual truths may be regarded

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[1] *Principles of Logic*, pp. 133, 135.
[2] Certainly it is more difficult to understand ' exceptis excipiendis ' when a rule is stated in extension ; e.g. if, instead of saying, ' Man responds (*or* men respond) to kindness,' we were to say ' All men respond to kindness '.

as admitting no exceptions—e. g. ' Blessed are the meek.' On
the other hand, many statements of revelation are cast in a
designedly general form, without simultaneous mention of other
and complementary truths.   We are to compare spiritual things
with spiritual.

§ 199. Identity, however, has nothing whatever to do with con-
tingent uniformities.   It does not say that things will not depart
from their more or less fixed sequences—e. g. ' gentilhomme est
toujours gentilhomme '—, but only that, apart from any *reason*
to suppose differently, a fact as given may be built upon infe-
rentially.   The universe is not a flux.   Truth exists.   Reality
is self-consistent.   Reasoning is possible.

CHAPTER VII

SUFFICIENT REASON

§ 200. THE Principle of Identity, we have seen, affirms that a thing being thought generally as having certain characteristics must be thought as having the same characteristics at various times and in various circumstances, unless and until some cause of change occurs. There is stability in things, else there is no truth.

§ 201. Or, avoiding the metaphysical ideas of change and cause, let us lay it down—though the thought may be a more difficult one—that for every *difference* there must be a sufficient *reason*.

Thus regarded from the logical standpoint, the Principle of Identity may be called a principle of Sufficient Reason.

§ 202. As no phenomenon can come to exist—since coming into existence implies modification of the previously existing order of things—without a cause, so no statement can be made, no advance can take place in our thought, without an adequate ground. For by every new assertion or judgement our existing knowledge is varied. A proposition must be in a sense fresh, or it would not be made.

§ 203. As the metaphysical doctrine that every change must have a cause has to be distinguished from the physical theory of the Inertia of Matter—even if this may ultimately be resolved into that—, so the impossibility of judging without a logical ground must be distinguished from the psychological inability of any judgement to be formed, or to find utterance, without certain material conditions, such as a judging subject, the constitution of the thinking faculty, *data* of experience, and some occasion effectuating decision.

§ 204. Objectively, no assertion can be justified apart from the allegation of a ground. And, subjectively, there can be no consciousness of validity in the synthesis between subject and predicate apart from some element of universality in the factors of the judgement. A judgement is always considered by him

who judges as necessarily formed.[1]   The apprehension of justification is essential to all our thinking.   Even an actor's, or liar's, words are *propounded* as unavoidable.   'Universality,' observes Bosanquet, 'is a property of all judgement whatever.   I not only feel that my judgement is inevitable for me, but I never think of doubting that, given the same materials, it is obligatory for every other intelligent being.   If some one disagrees with a judgement of mine, I try to put the case before him as it is in my mind; and I am absolutely sure that, if I could do so, he would be obliged to judge as I do.   If it were not so, we should never think of arguing.'[2]   'But,' says the same writer, 'necessity involves mediation or inference.   No isolated judgement, *qua* isolated, can have necessity.   Every necessary truth must, in so far as it is necessary, present itself as the conclusion from an antecedent.'[3]   In other words, every assertion is an interpretation.   Hence the possibility of mistake.[4]   But, while conscious of fallibility, we enounce every judgement as necessarily formed. The weather is bad.   Badness *must be* predicated of the weather.

§ 205. The rule 'infer nothing without a reason' obviously forbids a logical impossibility.   But 'think nothing without a reason' is an equally jejune and superfluous counsel.   It should be, 'think nothing without putting the reasoning clearly and plainly before your mind.'   What makes us smile at a statement is often the paradoxical character of the mediation, were it explicitly enunciated; either its absurdity, as in the old play— 'I am sure they talked of me, for they laughed consumedly'; or its audacity; as in *King Henry the Fourth*—'She's a woman, and therefore to be won'; or its simplicity, as when in Reade's great historical romance, *The Cloister and the Hearth*, Gerard out of gratitude offers to pen a letter for the serving-maid, which she declines, saying, 'He is in the house'; or its unexpected insinuation, as in the moral to the American inversion

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[1] 'Judgements are regarded as true only in so far as they are necessary' (Sigwart, *Logic*, i. 184).   'Every truth is necessary, although every proposition is not necessarily true' (Lewes, *Hist. of Phil.* ii. 476).

[2] *Essentials of Logic*, p. 26.

[3] *Logic*, ii. 224.

[4] 'All error and strife are due in the last instance to a difference between the psychological ground of certainty and the ground of truth, to the possibility that momentary belief may err, and the temporary feeling of certainty deceive us' (Sigwart, *Logic*, i. 193).

of the hare and tortoise fable—'The race is not always to the *slow*'; or its bantering malice, as in *Tancred*—' "Jerusalem! What on earth could they go to Jerusalem for?" said Lord Carisbrooke. "I am told there is no sort of sport there." '

§ 206. We are certain that 'every why has a wherefore', whether a plain reason is forthcoming, like the footprint from which Crusoe inferred human neighbourhood, or we have to say with Lucetta—

> I have no other but a woman's reason.
> I think him so because I think him so.

Her judgement of Protheus rested on an intuition of taste. 'To those who like that kind of thing,' said Abraham Lincoln, 'that is the kind of thing they like.' Our not being able to sound the depths of our thoughts does not prove that they are non-rational. The reason is there, though it cannot be produced. No doubt we must ultimately come to primary facts of belief, where the material for judgement passes into judgement without it being possible to analyse the psychological transition.[1] This unanalysable starting-point of conviction ought not, I consider, to be called an act of judging; at any rate the phrase 'sensory judgement' is objectionable. Tertullian's reason for belief is an *O altitudo!* 'Credo quia absurdum'. Newman says that to him there were ever only two perfectly self-luminous existences—himself and God. To seek a proof of one's own existence, indeed, is to try to get behind consciousness. It is as though a person going round in a wheel were to think that by going faster he could see his own back. τὸ αὐτὸ νοεῖν ἐστίν τε καὶ εἶναι. 'Cogito, ergo sum.' As St. Austin writes:—'Omnis qui utrum sit veritas dubitat in se ipso habet verum unde non dubitet.'[2] But, though perception is not judgement, to assert something 'on the evidence of

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[1] Fichte asks:—'Why not rest contented with the fact that something *is*, instead of supposing that it must have *become* through some source outside itself? You have been wont to *think a ground* of everything, but forget that the ground itself is your *thinking*' (qu. Lewes, *H. of P*. ii. 568). But it is one thing to say that a ground cannot be given, and another to argue that it does not exist.

[2] *De Vera Religione*. The man who prayed, 'O God, if there be a God, save my soul, if I have a soul,' had nothing whatever to start from, no ποῦ στῶ of consciousness. Hegel says, 'If God be not, there is nothing.' If *I* am not, I cannot say even that. To Locke the ontological certainties were God, the world and the soul.

my senses' is the first stage of judging. This, as Bosanquet remarks, is not a refusal to give a reason for my assertion, since sense-perception is not the asserted fact itself but the evidence for it.[1]

§ 207. Nor do we refuse to justify a judgement when we rest it upon authority. To appeal to an *Ipse dixit*, αὐτὸς ἔφα, 'the Master said it,' is open to no rational objection. It only throws the *rationale* a step further back. Why do you trust the authority? And the answer is no less an answer because it may be an unanalysable instinct of devotion, or a vague recognition of superior knowledge. Is there any statement we ever make in daily life which has not in it some element of deference to the knowledge, information, or character of others? 'It is midnight.' 'There was a scene in the Commons last night.' 'Mr. X is unmarried.' 'This is Radstock coal.' 'My letter gave universal pleasure.' Which of these state-ments have we verified by the direct testimony of our own faculties? No assertion is ever in practice really demonstrated, carried back to ultimate intuitions, and very few minds could follow the demonstration if it were. Authority intelligently recognized makes the tedious task unnecessary.[2] We do not wrangle with our dentist as to which implement he is to use, nor with a cabman as to the shortest way to Charing Cross. The *rationabile obsequium* of which Joubert speaks—'In poetry

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[1] *Logic*, ii. 17.

[2] The Right Hon. A. J. Balfour, in his *Foundations of Belief*, remarks that alike the ultimate analysis of *what* we believe and the ultimate proof of by what *right* we believe elude us. Yet we do believe; and 'in all branches of knowledge conclusions seem more certain than premisses. . . . In all of them ideas so clear and so sufficient for purposes of everyday thought and action become confused and but dimly intelligible when ex-amined in the unsparing light of critical analysis.' He speaks of the 'comparative pettiness of the rôle played by reasoning in human affairs', and finds our superiority over brutes to consist 'not so much in our faculty of convincing and being convinced by the exercise of reasoning, as in our capacity for influencing and being influenced through the action of Authority'. He points out the falsity of the popular conception that Reason 'is a kind of Ormuzd, doing constant battle against the Ahriman of tradi-tion and authority', and that 'its gradual triumph over the opposing powers of darkness is what we mean by progress' (pp. 281, 283). Mr. Wilfrid Ward's Essay in *Problems and Persons* (1903) on Mr. Balfour's treatment of the subject is well worth reading.

I should fear to go wrong if I differed from poets, in religion if I differed from the saints'—applies to much commoner matters. There are very few things we can attempt to think out for ourselves. But in the higher kinds of self-surrender faith is touched by the spirit of sacrifice and disciplined by trial. It must be man's care not, out of laziness or cowardice, to bow before that which he does not really respect. Never was individuality more needed than in a period of individualism, in which the leadership of imperial and commanding minds has given place to the tyranny of a stereotyped and commonplace mould of average opinion. ' La faiblesse,' says Mme. Roland, ' tremble devant l'opinion, le fou la brave, le sage la juge.'

§ 208. Inasmuch as every cause is an effect, and for every ground we must give a reason—everything, that is to say, has to be explained by some other thing—we are carried back finally in the one case to Creative Will, *causa sui*[1]—so that ' if there were not a God it would be necessary to invent one '—and in the other to the original facts of consciousness and self-evidence. Otherwise, either we have an infinite regress, or else all things revolve in an eternal circle. The absolute Whole is then to itself both subject and predicate, its own cause and its own effect. Demonstration is reduced to one term ; the world becomes a single Thought.

§ 209. The First Cause, *causa causans et non causata*, admits, consequently, of no proof *a priori*, that is, from cause to effect.[2] But if we believe in it as Primal Will, it cannot be irrational to think of νοῦς καὶ πᾶν τὸ δι' ἀνθρώπου as a minor spring of action, an ἀρχὴ πράξεως, and of creaturely wills—whether conceived as

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[1] ' That which persists, unchanging in quantity but ever changing in form, under these sensible appearances which the universe presents to us, transcends human knowledge and conception. It is an unknown and unknowable power which we are obliged to recognize as without limit in space and without beginning or end in time' (H. Spencer). Spencer speaks of being painfully overpowered by ' the consciousness that, without origin or cause, infinite Space has ever existed and must ever exist '. He rejects Kant's doctrine of Space as ' the subjective conditions of the sensibility, under which external intuition is possible, even as Time is the formal condition of *all* phenomena whatsoever '. He maintains that all the suggested origins of the universe of things are unthinkable.

[2] Benn (i. 150) quotes the baron in *Thorndale* : ' I believe in God until your philosophers demonstrate His existence.'

finite portions of 'will-stuff' detached for each personality or in some other way—as to some extent creative ; each 'a god below',[1] a cause and not an effect, able in a limited sphere to originate and therefore to revolt, yet finding itself by losing itself in the perfect Will of God. The relation of motives to freedom of choice is an insoluble problem. Yet motives only become motives by being taken up into the self, which is free from necessity (ἀνάγκη) as well as from coaction (βία).

> *Decius.* Most mighty Caesar, let me know some cause;
> Lest I be laugh'd at when I tell them so.
> *Caesar.* The cause is in my will. I will not come.

It is noticeable that, when we speak of being 'determined' to do this or that, we use determinist phraseology, as though we were pulled and pushed about by our wants and environment. Yet no word seems so strongly to convey the idea of complete freedom of the will to react on circumstances as the word 'determination'.

> Thou art thou,
> With power on thine own act and on the world.

If freewill is a delusion,[2] it is, of course, as irrational to praise the victorious in the agony of self-conquest as to commend a turnip for growing.[3] We should talk rather of golden events than of golden deeds.

§ 210. A proposition, then, is not irrational and groundless because the ground assigned is the *fiat* of volition—*sit pro ratione voluntas*—any more than it is ungrounded because the

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[1] Not, however, in Virgil's sense of—
> Sua cuique deus fit dira cupido.

[2] Shakespeare repudiates the Calvinistic or Mahometan view of the Divine decrees :—
> *K. Rich.* All unavoided is the doom of destiny.
> *Q. Eliz.* True, when avoided grace makes destiny.
> *King Richard the Third*, iv. 4.

Whitefield himself allowed that an ounce of grace would go as far with some as a pound with others. In theological language grace is both *pre-veniens* and *co-operans*, the latter word implying the will's liberty of choice.

[3] Praise, of course, may be a stimulus to well-doing, and so finds a place in Determinist systems. But inward commendation is what is here meant.

ground is a primary intuition, of which no further account can be given.

§ 211. '*Why?*' asks the *reason* for a thing being what it is said to be, and this reason may be either the cause of a phenomenon or the ground of a statement. (1) How do you *account* for S being P (*ratio essendi*)? How (*unde*) does it come to be so? Or (2) How do you *know* that S is P (*ratio cognoscendi*)? Why (*cur*) do you say it is so? This man is deaf. Why? Because he had a fall, which makes him deaf. Because he takes no notice, which shows him to be deaf.

§ 212. Either of the answers itself requires an explanation. In the explanation of cause and effect we arrive ultimately at the fact of the constitution of the universe, beyond which lies the will of the Creator. In assigning the ground of a statement we are pushed back and back to the native necessities of thought. But while we are not bound to know anything about the cause of S being P, the ground for our asserting S to be P must, whether consciously realized or not, have been in our mind. Even if we repeated it at second hand, we had a reason for trusting our informant. No one thinks a thing without thinking he has a reason for thinking it; though to demand that he shall give a reason for thinking he has a reason cannot be repeated *ad infinitum*. The final reason, for instance, for all conduct is our conception of the *Summum Bonum*.

§ 213. Not only does the justification of a statement by its ground require two premisses, but the explanation of a phenomenon by its cause requires two antecedent statements. This wax is melted, because it has been near fire, and fire melts wax. Either statement again has to be explained by two other statements, the one a fact, the other a law. (1) How did the wax come to be near fire? I put it in the fender, and whatever is in the fender is near fire. (2) Why does fire melt wax? Because of the material constitution of wax on the one hand and a general law of liquefaction by heat on the other. And so on. Similarly, the ground for every assertion is itself grounded on two assertions, the one, the major premiss, stating a general principle, the other, the minor premiss or subsumption, stating what is, relatively, a presentation of consciousness. And either premiss branches out again regressively in two directions, leading back, on the one side to primary perceptions, on the

other to axiomatic laws. The plasticity and fertile energy of nature corresponds to the ramifying complexity of demonstration.

§ 214. It is of importance to notice that the explanation of a phenomenon is a *rational* process, and gives the *reason* why the phenomenon *might be expected* to be as alleged. The reason your dog loves you is that you treat him kindly, and dogs always love those who treat them kindly. What we have here is an *inference*, that the dog may therefore be expected to love his master. *X* is unbusinesslike, because he is a poet and poets are unbusinesslike. In assigning a cause we are *justifying* an expectation. The middle term, which gives the cause of the fact, is the ground of the judgement. The observed fact is explained by the theory, the conclusion and the fact corresponding.

§ 215. The *causa essendi*, then, must be a *ratio cognoscendi*,[1] though, as we shall see, the converse is not always true. The material process *in rerum materia*, being apprehended by us, gives rise to the logical process in our mind. But the conclusion (which *follows*, not *results*) has always an ideal, abstract, necessary, and rational character. Sir Galahad's strength is as the strength of ten because his heart is pure. And knowing his heart to be pure we may be sure (conclusion) that (as a result) his strength is as the strength of ten. It is slippery because it has frozen. It has frozen, therefore I conclude that it is slippery. All statesmen who speak truth are unpopular. This statesman speaks truth. You may be sure, then, that he is unpopular.

§ 216. This is deductive inference, from cause to effect. But we also argue inductively from effect to cause. The knight's heart, we are certain, is pure because his strength is as the strength of ten. It must have frozen because it is slippery. That

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[1] Why has no one recently entered the cave? Because a spider has built her web across the mouth of it (*cognoscendi*). Because a lion has made his lair in the entrance (*essendi* and *cognoscendi*). The lion could keep a man out. The spider could not. Again, debate of battle could not *make* a knight's lady to be fairer than others; though, given the premiss that right and truth in such an arbitrament always prevail, it could *prove* her to be so. On the other hand, in the doctrine of grace, the means whereby we receive the same is a pledge to assure us thereof.

the politician speaks truth is shown by his being unpopular. The *ratio cognoscendi* here is not the *ratio essendi*, but an *a posteriori* sign or indication. 'Rain has fallen because the brook is swoln' is not the same kind of proposition as 'Rain will fall because the clouds are low '. Falstaff combines both—' The tree may be known by the fruit, as the fruit by the tree.' Compare the force of the two 'bys' in the following :—

> (1) Brave duke Schomberg was no more
> By venturing over the water.
> *The Boyne Water.*

> (2) By the pricking of my thumbs,
> Something wicked this way comes.
> *Macbeth.*

§ 217. It might be said of some place that it must be healthy because it has so few deaths, or so few doctors, or so few fogs and east winds. The first reason is a sign, the last is a cause. The second, intended as a sign, might be jocosely taken as a cause. In the report of a Dublin benevolent society it was remarked that, ' notwithstanding the large amount paid for medicine and medical attendance, very few deaths occurred during the year.'

§ 218. If the major premiss of an *a posteriori* argument directly asserts Y to be an invariable sign of the presence or existence of X, the reasoning is unchallengeable. Since 'by Tre, Pol and Pen you may know the Cornish men ', I can infer at once that the house of Pendennis is from the Duchy. ' Blue-eyed white cats are always deaf' cannot mean that blue eyes and white fur cause cat-deafness, but only that they are an indication of its presence. I am sure then that this blue-eyed white cat is deaf. Contrast ' Cooks are always bad-tempered '. Contrast also ' There is no smoke without fire ' with ' There is no fire without danger'. ' Creaking shoes have not been paid for,' ' Those who shun quarrels are wise,' ' Still waters run deep,' and many by-words about the weather, are examples of sign propositions. There is often nothing to distinguish them from causal proposi-tions or propositions about the inherence of a quality in a subject—e. g. ' Whoever speaks thus is foolish ' from ' Whoever speaks thus is punishable '. But, just as causal propositions are sometimes stated as such—e. g. ' A green Yule makes a fat

churchyard', so others are stated as symptomatic—e. g. 'The habit proclaims the man'; 'A fool is known by his laughter'; 'Eyebrows which meet indicate bad temper'; 'A mole is a sign of riches'; 'Not to know me argues yourselves unknown.' Old men are bald, scant of breath, and the like, and Falstaff is 'written down old with all the characters of age'.

§ 219. A sign is not always distinguishable from formal cause. E. g., a ripe strawberry is red, juicy, sweet, and fragrant. Being a true gentleman makes a man (*ratio essendi*) courteous to all, self-respecting, &c.; and we say he is a true gentleman because he is courteous, &c. (*ratio cognoscendi*). But such constituent characters are together the formal cause of true gentlemanliness. A tinker mends pots, and we know him to be a tinker thereby, mending pots being both sign and formal cause. In the line 'Non volucres pennae faciunt, nec cuspis Achillem' *faciunt* means 'constitute formally'.

§ 220. It is only when, as in a definition or the predication of a property, the predicate of a proposition is convertible with the subject, that inductive inference from a sign, that is, from effect to cause, is secure. In other cases it is liable to be upset by plurality of causes. 'Why do you say it has rained?' 'Because the pavement is wet.' But a watering-cart may have passed. Courtesy may be a mask, like Absalom's or Bolingbroke's in *Richard the Second*. Similarly, when we are explaining a fact rather than justifying an assertion — e. g. 'Your dog loves you because you treat him kindly'—we can suggest *a* cause for the phenomenon, but not say certainly that this is *the* cause.

§ 221. A cause is a reason for a thing being what it is, and a reason is a cause of a thing being known to be what it is.[1] The presence of a cause makes the effect to be expected, and the presence of an effect makes the cause to be suspected. A

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[1] Dr. Bradley asks the question—Is the Cause, as we know it, always a Because? Does every *because* appear as a *cause*? He denies that the process of our logical movement is bound ideally to counterfeit the course of phenomena, and to present us with the actual changes of events (*Principles of Logic*, pp. 486, 529). The chapter is worth study; but the de-railing of logical trains of thought by the nomad Chunchuses of philosophy is truly mischievous. If Dr. Bradley's general argument is right, there is no such thing as science.

cause is a sign justifying an expectation, and a sign is a cause producing an assertion. When we can justify a judgement both *a priori* and *a posteriori*, by the γνωριμώτερον φύσει and also the γνωριμώτερον ἡμῖν, by the coincidence of συμπέρασμα (conclusion) and ὅτι (observed fact), the judgement is on the way to be demonstrated.[1]

§ 222. Although in General Propositions the cause or ground for an assertion is commonly indicated in the subject of the sentence—'Judges should be uncorrupt'; 'Vaccinated persons escape small-pox'; 'The hireling fleeth because he is an hireling' —it is never confined to the subject.[2] 'The King is above party' —the King being who he is and party being what it is. We learn that honesty is the best policy by considering what we know about honesty and also about good policy. No man (i. e. no hero) is a hero to his *valet-de-chambre,* because the one is a hero and the other is a valet. In Negative Judgements, which are converted simply (No *A* is *B*=No *B* is *A*), the ground may be considered as lying evenly between subject and predicate. Of Particular and Concrete-universal Judgements, the ground must be sought outside the sentence.—'Some Indians are fair-skinned.' 'All the men of my year took honours.' But this is so also in the case of general propositions when the cause of an observed uniformity is not known (e. g. 'Blue-eyed cats are deaf'), or not suggested (e. g. 'West country ballads are the finest'). In Analytical Judgements the ground resides explicitly in the subject, as 'Development must be in accordance with type' (or it is not development). In 'Synthetic Judgements *a priori*', the reason must be sought not in the definition but in 'the necessity of the thing'; e. g. 'A triangle has its angles together equal to two right angles'.

§ 223. The sufficiency of a reason cannot be investigated by logic. We are constantly, however, protesting against insufficient reasons. 'Because thou art virtuous shall there be no more

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[1] Demonstration should be *per causam proximam et immediatam et primam.* But Aristotle uses ἄμεσος and πρῶτος to signify either the first cause in a series of events, or the cause which lies nearest to the ultimate effect, or phenomenon under consideration. See Trendelenberg, § 16.

[2] 'The ground in thought often belongs to the effect in time, but may be any element whatever related to the real ground, whether cause, effect, or abstract principle' (Bosanquet, *Logic,* i. 267).

cakes and ale?' Such insufficiency is often intentional and humorous. 'À propos de bottes, où est ma tabatière?' The imprudent marriage with the barber in the Great Panjandrum will possibly occur to the reader. The following may be quoted from the *Vicar of Wakefield* :—' My wife protested she could see no reason why the two Miss Winklers should marry great fortunes and her children get none. As this last argument was directed to me, I protested that I could see no reason for it neither ; nor why Mr. Simpkins got the ten thousand prize in the lottery, and we sate down with a blank.'

§ 224. But, though Logic cannot investigate the sufficiency of a reason, it is bound to examine the sufficiency of reasoning. As the Axiom of Consistency, then, forbids a conclusion which contradicts the true one (the Axiom of Persistency having compelled the drawing of the true conclusion), so the Principle of Sufficient Reason (or Reasoning) prohibits irrelevance and inconsequence. It is not a positive criterion of truth, but is defensive and protective, standing at the entrance of knowledge to keep out judgements which cannot justify themselves rationally, i. e. which are not the conclusions of a valid syllogism.[1]

§ 225. In elucidating the Law of Rationality, the structure of Thought, whose connexions are governed by that Law, has been inevitably, to some extent, assumed. We have now to examine the Form of Thought, the mould in which human intelligences are constituted to think, more closely. If thought were only an identification, or an equation of quantities, $A = B = C$, Logic would be a simple thing. But the construction of our thought is conceptual. Its connexions are, so to speak, qualitative. Instead of counting facts, we have to bring each fact under a principle. Instead of bundles of unrelated impressions, we have to do with cases subsumed under abstract notions, with the one in the many.

But first it will be necessary to consider whether the usual doctrine that there are three Forms of Thought is correct.

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[1] Mansel says that Sufficient Reason is 'no law of thought, but only the statement that every act of thought must be governed by some law or other' (*Proleg. Logica*, p. 198). But why *must*? It is a law that every act of thought shall be governed by a law. This is more than a mere observed fact.

NOTE

Narrative Judgements

In logical treatises the examples are nearly always in the present tense, historic and narrative assertion being almost wholly ignored. For what is universal and general is not very naturally predicated from the standpoint of the past or of the future, and there must be a universal element in all reasoning. And yet by far the largest number of our assertions are statements that something has happened, and that the causes and consequences were this or that.

It is only in reflective and philosophic prose that the principles and laws underlying the succession of events are dwelt on. Usually a narrator states only concrete happenings, not abstract rules. He concerns himself with effects, not with inferences. All connected narrative—even Homeric adventure-tale or the most artless 'once upon a time'—implies, it is true, at every step some law or generalization to explain how an event came about. But the implied law is usually too obvious to need stating. Only the facts, then, are given. 'The frightened cow tugged at the rope, and this, being rotten, snapped; whereupon Daisy, finding herself free, jumped the hedge; but, catching her foot, fell, and in this way broke a leg. In consequence, she had to be destroyed. The children wept, as she was a great favourite, owing to her gentleness. I showed them, however, a picture-book, which dried their tears.' The implied generalizations are such as 'creatures which are frightened try to get loose'; 'ropes which, being rotten, are tugged at snap'; and so forth. The *ratio essendi* is constantly suggested only. 'The rain had fallen, the poet arose.' 'You have said your lesson well; you shall have a penny.'

A universal can, no doubt, be stated from the standpoint of past time. 'Ever upon the topmost roof the banner of England blew.' 'Quicquid conabar dicere carmen erat.' 'In Adam all died.' It is not more easy to say 'An Amurath to Amurath succeeds' than 'Aylmer followed Aylmer at the Hall, and Averill Averill at the Rectory.' But narrative universals are usually concrete. 'They all slumbered and slept.' 'Everything was lost.'

Mr. Sidgwick gives the name 'abstract-concrete' to concrete propositions which directly assert causation[1]. 'X caused Y.' If so, 'Y was an effect of X' must also be so called. 'Just for a handful of silver he left us,' or 'The hot sun is melting the wax,' may be read either way. The concrete meaning, Sidgwick

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[1] *Fallacies*, p. 77.

observes, is primary, and the abstract meaning is implied rather than asserted. In other words, when we find inductively that one thing, X, caused another, Y, though this is a concrete statement the Law of Causality entitles us to generalize it in the abstract form, 'X causes Y.' The same with the inherence of a quality. 'This wax, because it is wax, is sticky.' Then wax is sticky.

CHAPTER VIII

WHATEVER IS RATIONAL IS SYLLOGISTIC

§ 226. THOUGHT has both form and matter. The matter is the things thought about, the content of the terms. The form is the conceived or judged relations of the terms. The matter of Thought is supplied to it. The form is produced by the activity of Thought itself, exercised upon the objects.

§ 227. The relations between objects which are governed by rational law are not material relations—e. g. *gold* is heavier than *silver*; nor those which are subjectively related to the thinker's own mind; but only objective relations in thought. Modal elements, accordingly, must in Logic be viewed as part of the content of thought, not as part of its form. Mansel, following Kant, observes that *psychologically* modality belongs to the form of the judgement. But, he adds,

'the forms cognizable by Psychology must not be confounded with the forms cognizable by Logic. The latter science is not concerned, as is sometimes maintained, with the Forms of Thought in general, but only with the forms of thought as related to pure or formal thinking . . . In cases where a modal conclusion is drawn from modal premises, it is only the form of the conclusion, *as a judgement*, that differs from that of the pure syllogism. Its relation to the premises *as a conclusion from them*, consequently the entire *form of the reasoning*, is the same in both.'[1]

For example, 'The men of that regiment are, perhaps, coming home. My son is in that regiment. Therefore he is, perhaps, coming home.' The conclusion, as a proposition, is modal. But, as a conclusion, it is drawn necessarily from the premisses. For every conclusion is necessary.

The subject of Modality will be further considered below (§§ 605 seq.) under Judgement.

§ 228. If—which is the view taken in this book—thinking is the same thing as judging, the Form of Thought is identical

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[1] *Proleg. Logica*, p. 233.

with the Form of Judgement. But, because Judgement is conceptual, the thinking of objects under concepts, it will be found necessary also to analyse Conception.

§ 229. Should, however, the right of Conception to be regarded as a separate Form of Thought be maintained, the Form of Thought is then twofold. Logical treatises, on the other hand, almost invariably speak of Three Forms of Thought —Conception, Judgement, and Ratiocination. To these correspond the Term, the Proposition, and the Syllogism. And most writers say that Logic is concerned with all three alike.

§ 230. It is necessary, therefore, to point out the entirely different footing on which Syllogizing stands in Logic from that which is occupied by Conception and Judgement.

§ 231. The Syllogism is essentially *rational*, whereas Conception and Judgement are *intellective* and *cognitive*, not rational *per se*. But Logic is only concerned with rational processes. If it deals with Cognition, it is only with a view to understanding how the connexions of actual Thought are subject to the Law of Rationality.

§ 232. Logic is not therefore concerned with Conception and Judgement directly, unless concepts and judgements can be shown to possess, always or sometimes, an *internal rational character*. Every judgement, as we have seen (§ 27), is *rationalizable* through its ground. But the statement of the ground turns the judgement into a syllogism.

§ 233. I have above (§§ 38 seq.) attempted to show that there is no such thing in thought as *immediate* consequence, though a language rich in synonyms like the English will show many pleonasms—e. g. 'strolling vagabond'. The argument may be further illustrated in this chapter.

§ 234. The nearest approach, perhaps, to a seemingly immediate implication in a Concept is the Hebrew idiom to express emphasis, imitated in the Versions in such phrases as 'gaudens gaudebo' (translated 'I will greatly rejoice'); 'dying thou shalt die' (Gen. ii. 17); γινώσκων γνώσῃ (Gen. xv. 13); 'circumdantes circumdederunt me' (Ps. lxxxviii. 17); 'exspectans exspectavi' (Ps. xl. 1); 'castigans castigavit me' (Ps. cxviii. 18); 'blessing I will bless thee, and multiplying I will multiply thee' (Gen. xxii. 17); 'with desire I have desired' (Luke xxii. 15). Akin to this idiom is the grammatical cognate accusative, not

further qualified—' I will tell you a tale ' (not, 'a moving tale ') ; ' ludere ludum ' (not, 'ludum insolentem '); 'somniare somnium ' ; 'iurare iusiurandum '. Again, we get phrases like 'the footstool of his feet ' (Matt. v. 35 R.V.).

There does not, however, appear to be much more rational implication in such idiomatic phrases than in the ' hear, hear ' or 'divide, divide, divide' of parliamentary emphasis. The thing affirmed is re-echoed, though in a different grammatical form. In phrases like 'cent nouvelles Nouvelles ' or 'la vérité vraie' the substantive has a quasi-conventional sense. 'A kingly king,' again, draws attention to the qualities a king should possess. There could be an unkingly king, but not a non-royal king.

§ 235. Seeming verbal confliction in the elements of a Concept is much more common than verbal necessitation. Oxymoron is found in all languages, but especially in the Greek poets—βίος ἄβιος; δῶρον ἄδωρον; νύμφην τ᾽ ἄνυμφον, παρθένον τ᾽ ἀπάρθενον; ἑκὼν ἀέκοντι δὲ θυμῷ. Philo speaks of βιβλία ἀβίβλια. Even Latin has this figure—e. g. 'concordia discors '. In *King John* the line occurs—'Most forsworn to keep what thou dost swear.' Fuller says of Henry VIII 'that he was certain only in uncertainty ' ; which is like 'constant only in inconstancy.' Hooker speaks of 'confessing without confession that God's glory is inexplicable ', and of silence being our safest eloquence concerning Him.

It is obvious, however, that in these and similar tropes there is not any attempted combination in the same notion of an idea and its actual contradictory, as there would be if we tried to conceive a four‑footed biped, compulsory volunteering, a cultured boor, or twelve a.m.

§ 236. Logic disallows real contradictions. A distinctly conceived contradiction in thought is, in fact, impossible. But the admissibility of any verbal combination cannot be decided by the logician until the facts are given him, which *datum* constitutes a middle term. Modern chemistry declares, for instance, that common salt has been wrongly analysed and that 'salt is not a salt '. Literature is full of paradoxical expressions, such as the following :—

Trinal unity ; ὠδῖνες τοῦ θανάτου (Acts ii. 24, birth pangs of death) ; a noonday night (Pope) ; laborious idleness (cf. 'strenua nos exercet inertia '); elaborate simplicity ; curiosa felicitas ;

stale news ; gospel of gloom ; living death ; and many similar expressions. Burke calls the French constitution-mongers architects of ruin. Macaulay styles Harley a solemn trifler. We use the phrase 'crowned republic', but could hardly speak of a monarchical republic. The rack is persuasion through force, but we could not well say 'persuasive coercion'. Herrick's lines are familiar :—

> Be she shewing in her dresse
> Like a *civill wildernesse,*
> That the curious may detect
> *Order in a sweet neglect.*

George Eliot's Amos Barton was 'superlative in nothing unless he was superlatively middling'. Charles the Second said pleasantly of Godolphin that he was never in the way and never out of the way. It was a whimsical saying of Bishop Creighton's that none do so much harm as those who go about doing good. 'Sir,' said Johnson to McAulay, who was 'rhapsodizing against creeds and confessions,' 'you are a bigot to laxness.'

Sacred paradoxes are common in divinity. Such are the words, 'He that keepeth his life shall lose it,' or St. Paul's, 'As deceivers and yet true ; as unknown and yet well known ; as dying and, behold, we live ; as sorrowful, yet alway rejoicing ; as having nothing, and yet possessing all things.' Compare 'There is that scattereth and is more increased' (Prov. xi. 24). Tertullian sublimely writes : 'Crucifixus est Dei Filius ; non pudet, quia pudendum est. Et mortuus est Dei Filius ; prorsus credibile est quia ineptum est. Et sepultus resurrexit ; certum est quia impossibile est.' St. Paul calls the Ephesian polytheists 'atheous' (Eph. ii. 12).

§ 237. Sometimes contrary attributes are combined in an expressive compound, such as γλυκύπικρος, θρασύδειλος, theandria, triune, chiaroscuro, pianoforte, forcible-feeble, hysteron-proteron, deadly-lively (or dead-alive), modern-antique, tragi-comedy, Voltaire's Micromégas, or the word oxymoron itself. Shakespeare speaks of 'this senior-junior, giant-dwarf, Dan Cupid', and of devilish-holy fray ('when truth kills truth'). Byron speaks of a cherub-hydra. In 'Demeter and Persephone' we find 'human-godlike'.

§ 238. Bulls of the Sir Boyle Roche type arise from the

imaginative nimbleness which outstrips the mere verbal phrase.[1] 'His remarks are so ambiguous that only one construction can be placed upon them.' 'The best way to avoid danger is to meet it plump.' 'If he had lived till to-morrow he would have been dead a fortnight.' 'The Liberal party can only stick to its present position by moving forward.' 'Would he were at the bottom of the bottomless pit.' 'Absentee landlords! Why, sir, my unhappy country swarms with them!' A native of that country said of a pig that had not come up to his expectations, 'I never thought it would.'

§ 239. Besides contradictions in terms which are superficially such, there are actual incompatibilities due to confusion of thought. 'I said nothing against Episcopacy,' protests Mr. Tomlinson in *Janet's Repentance*; 'I only said I thought we should do as well without bishops.' 'Every one to do as he likes, and those who won't to be made to' is the well-known definition of liberty, as 'One man is as good as another, and a vast deal better too' was the definition of equality. The undergraduate defined faith as belief in what we know to be untrue; and justifiable homicide was explained by some one as when a man kills himself in self-defence. In this class must be placed *malapropiana* like 'relics of the future' or 'anticipate the past'. On the other hand, 'Retrospection is best before the event' is a perfectly intelligible, though laughable, proposition.

§ 240. Many incompatibilities are, of course, intentional and merely ridiculous, like the schoolboy's pleasantry, 'no compulsion, only you must'; or the inscription to the gentleman who 'of his great bounty built this bridge at the expense of the county'; or that lamentable comedy in which the sweet moon is thanked for her sunny beams. There is mere ranting extravagance in love-sick Romeo's string of absurdities :—

> Why then, O brawling love! O loving hate!
> O heavy lightness! serious vanity!
> Misshapen chaos of well-seeming forms!
> Feather of lead, bright smoke, cold fire, sick health!
> Still-waking sleep, that is not what it is!
> This love feel I, that feel no love in this!

[1] Sydney Smith, however, defines a bull as 'an apparent congruity and real incongruity of ideas, suddenly discovered. Wit discovers real relations that are not apparent. Bulls admit apparent relations that are not real'.

A woman, we read in *Antony and Cleopatra*, should not lie but in the way of honesty. 'I have no land-hunger,' said the New Englander. 'I only want the ground which joins mine.' Then there are conceits like 'the other end of nowhere', 'less than no time', 'an infinite deal of nothing', or Smalgruenius' 'de omnibus rebus et quibusdam aliis'.

§ 241. But even when the inconsistency is real and not seeming, it is given materially rather than formally; and the logician is no more able to pronounce that good is never bad, nor blue black, nor solitude (in Shelley's phrase) populous, nor the self found by being lost, than he can pass a verdict on material impossibilities such as a mare's nest, hay-fever at the North Pole or skating on Phlegethon, the same fountain sending forth sweet water and bitter, the blind leading the blind, a Sunday in the middle of the week, or a crab hunting a hare. 'Demander de la laine de l'âne,' and 'in aere piscari, in mari venari', are as materially impossible as 'in silvam ligna ferre' is materially superfluous. Lucian has a conceit of milking a he-goat and catching the liquid in a sieve; and some one absurdly describes a tipsy man lighting his pipe at the pump. The man in the south burnt, we know, his mouth by eating cold plum porridge. Pure reason can no more condemn such combinations than it can declare impossible a midnight sun or 'April-autumns of the antipodes'. If its jurisdiction is allowed here, where is it to stop? Can a figure face north by south? Certainly, if it be, like Janus, *bifrons*. Petrarch speaks of a fountain in Epirus that kindled the quenched torch. Origen's phrase, 'aeterna et sempiterna Generatio'—a fact rather than an event—has its seeming self-contradictoriness only from the accidental association in our minds of begetting with a temporal beginning. 'Spiritual but real' is a common but quite false antithesis; and so also, since a body may be πνευματικόν, is the opposition between 'spiritual' and 'corporeal'.

§ 242. Most of the above illustrations are taken from concepts rather than from judgements. The only difference is that, whereas concepts couched verbally in the form $A A$ are hardly to be found, while those in the form A not-A are not uncommon, with judgements it is the opposite. 'Wise men are men,' says Jeremy Taylor, 'and truth is truth.' We say, 'Right is right and wrong is wrong.' Such expressions draw attention to the

intensive content of the subject term. But they can have, in this sense, no negative counterpart—*A* is not *A*—but only *B A* is not *A*. Shakespeare says: 'Love is not love, Which alters when it alteration finds.' In paradoxical expressions like φὴς σιωπῶν, or βλέποντες οὐ βλέπουσι καὶ ἀκούοντες οὐκ ἀκούουσιν (St. Matthew xiii. 13), the same word has a meaning in the predicate varied from that which it had in the subject; so that βλέποντες appears in St. Mark as ὀφθαλμοὺς ἔχοντες and ἀκούοντες as ὦτα ἔχοντες. Compare Aeschylus's κλύοντες οὐκ ἤκουον. This is so also in riddling sayings, like the French 'Si je suis ce que je suis, je ne suis pas ce que je suis' (a man driving an ass); or 'I went to India and stopped there; I came back because I did not go there' (a watch); or in *Gareth and Lynette*—

> The city is built
> To music; therefore never built at all;
> And therefore built for ever;

and the familiar 'When is a door not a door?' Of course self-contradictions in epigrammatic form are common. Such are—'Evil, be thou my good.' 'Magna civitas magna solitudo.' 'Quod expendi habui; quod servavi perdidi; quod donavi habeo.' 'Fair is foul and foul is fair.' 'Nihil peccat nisi quod nihil peccat.' 'The queen died every day she lived' (cf. ζῶσα τέθνηκε). 'Non est vivere, sed valere, vita.'

§ 243. But as no idea can be seriously denied of itself, só no idea can be really predicated of itself.[1] Instances to the contrary are merely whimsical or nonsensical. As in *Twelfth Night*—'Not to be abed after midnight is to be up betimes.' Or in *Antony and Cleopatra*—'It is as broad as it hath breadth.' Or in *Love's Labour's Lost*—'To be forsworn is a great argument of falsehood.' Or in *Hamlet*—'How came he mad?—*Gravedigger.* Very strangely, they say.—How strangely?—Faith, e'en with losing his wits.' The Spanish fleet in the *Rehearsal* could not be seen because it was not yet in sight. Madam Blaise never wanted a good word from those that spoke her praise; like the man in the *Elegy on a Mad Dog*—'The naked every day he clad, when he put on his cloaths.' The following from *Twelfth Night* is mere clowning—'Sayest thou that house

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[1] Such otioseness would be like, in action, 'preaching to the converted,' painting the lily, gilding refined gold, 'iuxta fluvium puteum fodere,' 'iugulare mortuos,' or carrying coals to Newcastle.

is dark? Why, it hath bay windows transparent as barricadoes, and the clerestories towards the south-north are as lustrous as ebony. And yet complainest thou of obstruction?'

§ 244. From what has been said in this and previous sections (§§ 48, 134), it is, I think, clear that there are no concepts the elements of which can be pronounced by pure reason *formally* to necessitate or invalidate one another; and similarly that no judgement is, as such, *formally* rational or irrational. Pure reason can never give its verdict on a proposition until a term mediating between subject and predicate has been appealed to; and the doing this constitutes ratiocination.[1] Concepts can only be rationalized in the same way. If words were guaranteed always to preserve identically the same meaning in every context, it would be otherwise. But then a concept like γάμος ἄγαμος would be impossible, and no concept at all.

No one would then speak of a white pink, of a ten days' quarantine, of a steel pen, a brass shoehorn, or a leather carpet-bag. Urbanity would be a *proprium* of cockneys, and an examinand in a black coat would cease to be a candidate. Grenadiers no longer throw grenades, and the *Fortnightly Review* since 1866 has been published once a month. Nor is a carte-de-visite for us a visiting card. 'Pagan,' originally a villager, came to mean (e. g. in Pliny) a civilian; in which sense St. Cyprian first applied it to non-Christians, as not vowed to the Holy War.

§ 245. To our conclusion that Logic is concerned with Syllogizing is quite a different way from the way in which it is concerned with Conceiving and Judging, it may still be demurred that at any rate Judgements frequently contradict *one another*, in which case a rational relation exists between thoughts apart from any mediation. All inconsistency between words and acts is really an attempt to combine incompatibles in thought. 'Clodius accusat moechos.' A Spanish official, being asked to help the Society for preventing cruelty to animals, suggested

[1] The concept cannot be analysed into its elements by an act of pure reason, any more than an object can be resolved into its attributes; and the 'discord' of 'hot ice' is as much and as little perceptible to pure reason as that of 'merry and tragical, tedious and brief'. Hobson's choice is no choice at all, and 'un seul choix' is no choice at all. But the one we learn by being told about Hobson, and the other by explication of the ideas of 'seul' and 'choix'.

raising funds by means of a bull-fight. There are iconoclast-idolaters. There are prophets who bite with their teeth and cry Peace (Micah iii. 5). It has been said of Shelley that he made a mythology of atheism; of Rousseau, that he was an apostle of nature in a periwig. The peacock bids to fly pride, and there is a 'pride which licks the dust', a pride, too, which builds, as Coleridge says, a cottage with a double coach-house. 'Quis tulerit Gracchos de seditione querentes?' In the Noyades Ferrier drowned in the Loire three thousand royalists in the holy name of humanity. The American Declaration of Independence, asserting that 'all men are created equal' and endowed with an 'unalienable right' to 'liberty', was issued by a body consisting largely of slave-owners. In the early decades of the nineteenth century doctrinaire individualism was in many parts of Europe found associated with military dictatorship, rights of man with coercionism. Daniel O'Connell was opposed to revolutionary violence; but Lord Clarendon said that the 'physical force' followers of Young Ireland had to be protected by the constabulary from the shillelaghs of the 'moral suasion' party. Some have 'fought like devils for conciliation', and some repent in purple and fine linen. 'When I tell Caesar he hates flatterers, He says he does—being then most flattered.' πῶς οὖν δίκαιον τοὺς νόμους ὑμᾶς βροτοῖς γράψαντας αὐτοὺς ἀνομίας ὀφλισκάνειν; 'Inconsistencies, said the prince, cannot both be true. Inconsistencies, answered Imlac, cannot both be right; but, imputed to man, they may both be true.' The anarchist, if assaulted, calls for the police. The absolutist invokes liberty. Rabagas, in office, fires on the mob. The latitudinarian is intolerant of intolerance[1], and dogmatizes against dogma. It has been said of Friedrich Nietzsche that he 'raised Immorality into a philosophic principle'—he called himself 'the first immoralist'. But his biographer, Dr. Carus, remarks— 'If there was a flaw in Nietzsche's character it was goody-goodiness, and his philosophy is a protest against the principles of his own nature.'

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[1] Intolerance being a genuine form of opinion. The argument is *ad hominem* on both sides. 'How can you, so enthusiastic for tolerance, persecute one form of belief, viz. mine?' 'How can you, who believe in intolerance, object to my suppressing you?' But perhaps he does not object *on principle*.

§ 246. But, whatever the confusions of thought by which men are led into inconsistencies, they never formulate their beliefs in the form of direct contradiction. Falstaff's tale about the footpads is so farcical because it unblushingly changes its statements as it proceeds. The men in buckram grow from two to eleven. Some were in Kendal green, and yet it was so dark you could not see your hand. The inconsistencies repose side by side. There is a reason for them; but the knight will not give a reason upon compulsion. When the inconsistency is pointed out it may often be denied. De Maistre spoke of 'un révolté qui prêche l'obéissance' as 'un spectacle un peu ridicule'. But that depends on circumstances. It is not like Pope's description of—

> those who temperance advance,
> Cramm'd to the throat with ortolans.

Again, if I change my mind—'Man,' says Herbert, 'is some twenty several men at least each several hour'—I am not trying to combine incompatibles. Scales fall from King Clovis' eyes, and then he is bidden—'Adora quod incendisti, et incende quod adorasti.'

§ 247. The only form of 'immediate' opposition between propositions is that between symbolic A and O, E and I. The only form of apparently immediate implication is that of I in A and of O in E. As regards the latter, I consider that we do not get from universal to particular without an appeal to the axiom that what is true of all is true of some. As regards the former, the impossibility of contradictories both being true is simply the basal law of Reason itself, *some* being conceived as equivalent to not none, and *some not* to not all. The ultimate law has to be invoked in any particular case of attempted self-contradiction.

§ 248. Once again, then, it has to be affirmed that Logic is concerned with Syllogizing directly, as an essentially rational process, and with Conceiving and Judging only indirectly, as the Form or Forms of Thought, the structure of which must be to some extent analysed that the government of Thought's connexions by Reason may be understood.

Yet it might be urged that as an act of comparison Syllogizing is a Form of Thought on a level with Conception and Judgement. Hamilton, for instance, says :—

'All thought is a comparison, a recognition of similarity or difference, a conjunction or disjunction. . . . In Conception it compares, disjoins, or conjoins attributes; in an act of Judgement it compares, disjoins or conjoins concepts; in Reasoning it compares, disjoins, or conjoins judgements.'[1]

§ 249. It is clear what 'comparison of attributes' means. Comparing the shape of the full moon and the shape of a plate and that of a wheel, or again comparing the appearance of the moon in its various phases, I get the notion of circularity. As regards 'comparison of concepts', however, we must insist again and again that this is not the import of Judgement generally, but only of Analytical Judgement. Comparison of concepts will show me that hope which is seen is not hope, but not that hope deferred maketh the heart sick. It will show me that a mule is a hybrid, but not that a mule is obstinate. Judgements which are not analytical are based on a comparison of percept with concept.

§ 250. What we really do in judging is to compare some attribute or combination of attributes, perceived as belonging to an object, with our conception of the distinguishing characteristics of some class. This ship, I see by its machinery, is a steamer. Or the ground of the judgement may be an attribute or circumstance thought of as peculiarly characterizing a *portion* of a class, divided extensionally. This ship, I see by its paddles, is a steamer. Not all steamers have paddle-wheels; but these, as belonging to a ship, are a peculiar characteristic of a sub-division of the steamer class. We could not have inferred that the ship was a steamer because it was built of iron, even if all steamers were iron-built; for some sailing ships are iron-built also. Judgement then is not a comparison of notions, nor yet of the attributes of two classes; for bread is nutritious and beef is nutritious; yet bread is not beef; but it is the comparison of some attribute of an object with a notion, by which, as a ground, the object is brought under the notion. Negatively, the judgement is diagnostic. This knight is not Sir Launcelot; for he wears a lady's favour, which does not agree with my notion of Sir Launcelot.

§ 251. We can thus scrutinize the assertion that Syllogism is a 'comparison of judgements'. For when we syllogize we

[1] *Lectures on Logic*, i. 13, 14.

do not pronounce two propositions to be like or unlike. What we do is to relate a concept with a concept, or a percept with a concept, by means of a middle term. We bring one term under another on certain ascertained grounds. But such *result* of our comparison is a rational, not a cognitive or judicial act. Syllogism is not like Squire Thornhill and Olivia placed back to back and judged to be 'extreamly of a size', but is like the height of the sentinel at Windsor being compared with the height of the soldier stationed at Hounslow by the help of an intermediary, who measured himself first with the one and then with the other. Reasoning, then, is not, as Jevons asserts, a judgement concerning judgements, but a rational conclusion based on judgements.

§ 252. We can syllogize by means of symbols only. But we cannot conceive without knowing what it is we are conceiving, or judge without knowing what we are judging about. Few concepts or judgements even suggest, on the surface, a rational process. Syllogism, on the other hand, is not syllogism at all except as it is seen to be reasoned. To the mere logician 'a wicked baronet' and 'a wicked saint' are like concepts. 'Cockney sportsman,' 'cockney countryman,' and 'cockney Londoner' being submitted to him, he can only say of each, 'nihil obstat ; per me licet.' But tell him that a cockney is a person born within sound of Bow Bells, and that any one so born is born in London, and he will at once decree the last concept to be a necessary one, the second an impossible one, while the first, as far as he knows, is purely contingent. There is no formal objection to it. A syllogism, on the other hand, cannot consist of mere compatible elements, but only of such materials as enable an energy of pure reason to set itself in motion.

§ 253. The only reason that can be given for ranking Syllogism with Conception and Judgement as a third Form of Thought is that it is discursive, and so dianoetic.[1] We may reply that it is an operation of the reason upon the connexions of thought, not an exercise of the intelligence upon the properties of things. But still (a critic may urge), 'putting two and two together' is the mode of human ratiocination as distinguished from the clear

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[1] McCosh defines discursive thinking as 'an exercise of mind in which we proceed from something given or granted to something further which is founded on it' (*Laws of Discursive Thought*, p. 47).

rational insight of the Divine Mind, which has not to pass from point to point, from one thing to another, neither 'becoming aware' of truths, nor 'arriving' at them by any process, but (as we must suppose) embracing condition and conditioned, antecedent and consequent, premisses and conclusion, in a simultaneous, indivisible act of contemplation.[1] At the other end of the scale brutes, that 'great and sane and simple race', with their marvellous instinctive powers, to some extent 'partake of reason', but do not exercise it, do not reason things out, or only dimly. Not to be bound to discursive ratiocination, then, one must be $\mathring{\eta}$ θηρίον $\mathring{\eta}$ θεός.

Charles Lamb in *New Year's Eve* amusingly deprecates translation to a higher sphere which shall separate him from his midnight darlings, his Folios. He has an 'intolerable disinclination to dying'. 'A new state of being staggers me. Must knowledge come to me, if it come at all, by some awkward experiment of intuition, and no longer by this familiar process of reading?'

§ 254. Certainly syllogism may be regarded as a proposition about a rational necessity in the form, 'All S being M when M is P necessarily involves S being P'; or thus, 'Every X which is Y when Y is Z is necessarily Z.' What is predicated in every such sentence is necessitation. 'The conclusion "S is P", under the simultaneous conditions of S being M and M being P, is a thing which follows necessarily.' But such an assertion of rational implication of 'predicate' in 'subject', though in a sense discursive, cannot, I submit, be regarded as a *judgement*, either syllogistic or analytic. There is no real judicial comparison between a subject and the concept 'rationally necessary'. If this view be combated, at least the nature of the comparison is different in kind from that of a comparison between *chalk* and *white* (synthetic), or between *ice* and *frozen* (analytic).

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[1] 'Inference, as a mental process, has duration in time; but as intellectual insight its parts are inward to each other, and exempt from temporal succession' (Bosanquet, *Logic*, ii. 5). 'To God, indeed, wisdom is as a high tower of pleasure, but to us a steep hill, and we toiling ever about the bottom' (Milton, *Tetrachordon*).

CHAPTER IX

CONCEPTION

§ 255. Having distinguished the Form of Thought from Rational Process, we can now proceed to analyse that Form, so far as is necessary for logical purposes. It is not necessary to wait till every psychological problem has been settled. The impossibility of thinking without language, for instance, is a question which, with all respect to Max Müller's protestation, we need not finally determine.

§ 256. Like the word Reasoning, so 'Thought' is used for faculty, process, and product. As it is not reasoning, so neither is it sense.

And whereas Conception is an ideally potential, that is to say a notional, conjunction of attributes in a possible subject, Judgement affirms or denies an actual conjunction of attributes in an ascertained subject.

§ 257. Conception has a material limitation, in that it is so far psychologically determined by the nature of things that no attribute can be conceived the elements of which have not been actually presented to our cognizance. 'Oh, could I with Fancy stray!' But phantasy or imagination cannot stray outside the boundaries of experience. The experience may, of course, be an interior experience. Fancy is bred, begot and nourished rather in the heart than in the head.

§ 258. On the formal side, Conception is limited logically by the requirement, or rather the necessity, that its elements shall not be mutually contradictory. No contradiction is conceivable.[1] A formally self-contradictory judgement is therefore as non-existent, really, as a formally self-contradictory notion (see above, § 235). On the other hand, we are not able to say that a concept is empirically possible, or that an assertion is

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[1] 'Whatever is intelligible and can be distinctly conceived implies no contradiction, and can never be proved false by any demonstrative argument or abstract reasoning *a priori*' (Hume on *Miracles*).

empirically actual, because its elements are acknowledged to necessitate one another. 'Omniscience which reads the thoughts of all hearts' is beyond our power of conception. 'Winged griffins which have the means of flight' are not actual.

§ 259. In all thinking we endeavour to discern the One in Manifoldness. We intellectually unify the variety of impressions received either through the 'watchful senses', the five windows of the soul, or through the inward consciousness.

Apart from the unity given by general conceptions, the information supplied by the inner or the outer experience would be unintelligible. The concept is 'an ideal unity within a phenomenal flux'. We can only 'know' by knowing scientifically; and science is the evolving of conceptual order out of sensory chaos. It is therefore of the highest importance that concepts should be rightly framed and answer to the permanent nature, the τί ἦν εἶναι, of things. Not that a concept can be true or false in itself—truth and falsehood are the peculiarity of judgements—but we endeavour to select the right notional category under which to place the object which we desire to know; although the marshalling of each presented experience under the proper head and in its true class is not the logician's business, but that of the inductive intelligence. For though we cannot judge without reasoning, yet *bonae notiones* are not secured by valid ratiocination, but by capacity and training in discriminating, appreciating and selecting the materials put before us.

§ 260. Thus, History is no mere medley or sequence of chance events. It is 'philosophy taking its time'. Otherwise we get but bare chronicles of a lifeless past—*historia nihil aliud nisi annalium confectio*. Hence the historian needs insight, imagination, sympathy—next best to which is antipathy. 'If,' says Dr. Bradley, 'the history of a thing is ever its explanation, this is because history can never be sensuous.'[1] What again is Memory if its records cannot be grouped and classified? A palimpsest scrawled with unmeaning marks. A stimulation of that part of the brain called the cortex. Or Art? Art is not a photographic transcript of 'facts', but their interpretation, the exhibition in the individual of what is universal and typical,

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[1] *Logic*, p. 493.

'divinely through all hindrance to find the man' behind the face, and to seek the ideal. To hold the mirror up to 'facts' is not necessarily to hold it up to nature,[1] nor are things really represented 'as they happen' if they are presented out of relation to other things, that is to say without suggesting a universal. It is just the universal element which gives the interest; and 'un-moralized' art is necessarily inartistic, though of course it is usually for the spectator to draw the moral.[2]

§ 261. We know things, then, by bringing presentations, or what are relatively such, under appropriate conceptions. 'This is a flint arrowhead.' 'Pigs are not domestic animals.' 'La propriété c'est le vol.' 'Art thou that my lord Elijah?' 'Haec est nobilis ad Trasumenum pugna.' The three last are identifications. But even in an identification the subject is cognized through something better known, and so possessing a certain general and abstract character. 'Fit Beroe.' 'Am I not thine ass on which thou ridest?' 'Covetousness which is idolatry' (cf. Eph. v. 5, 'a covetous man which is an idolater'). No predicate can be either purely abstract or purely concrete.[3] Nothing is conveyed by pointing with the finger and saying 'this is that', unless the 'that' is already known, and so an identity

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[1] Goethe, however, when he says, 'Art never would have been called Art had it been meant to be the same thing as Nature,' means by 'nature' the outward show of things before reflexion begins, isolated and bare 'facts'. Plutarch writes :—Ὁ Σιμωνίδης τὴν μὲν ζωγραφίαν ποίησιν σιωπῶσαν προσαγορεύει, τὴν δὲ ποίησιν ζωγραφίαν λαλοῦσαν.

[2] Benn (*The Greek Philosophers*, i. 156–8) has an interesting discussion of the influence of the ideal philosophy on Hellenic imitative design, which, however, at one period degenerated into 'sensationalism', while later, both in plastic and in dramatic art, it substituted abstract personifications and generic types for historic or mythologic flesh and blood. Yet by the help of these very abstractions the Greeks got back into touch with living, concrete things with a fuller understanding of life's meaning. Thus late arose biography; 'and, although biographies are the favourite reading of those who most despise philosophy, they could never have been written without its help.' Not that the Waltons and Boswells of literature intrude too many philosophic and moral reflexions on us; but sympathy, reverence and artistic feeling enable them to get behind accidents and mere 'anfractuosities'. The typical, by the by, is not the average. On the other hand Dickens mistakes for strong character drawing what is merely bizarre.

[3] 'At no point of our experience are we presented with pure Matter or with pure Form' (Mackenzie, *Outlines of Metaphysics*, p. 94).

constant through various contexts. This is so even in an algebraic equation—in which moreover ' equal to ' is not the so-called copula, but is part of what is predicated—or in such a proposition as, ' His name is John.' All thinking, then, is conceptual. We can only ' know ' by ' understanding '. It is true that, since a concept has ideally a plurality of applications, universal affirmations are not convertible simply—a spade is an implement, but an implement is not therefore a spade; whereas identifying propositions are simply convertible. ' Thou art the man.' The man is thyself. Nevertheless, in such identifications the predicate, whichever it is, is always for the moment regarded as more abstract and general than the subject—' thine ass on which thou ridest ' than ' I whom thou now beatest '; ' the man,' the merciless man of the tale, than ' thou sitting there '; or else, ' thou, the great king David,' than ' the man of my tale, who finds his explanation in thee '.

§ 262. When, instead of looking for an appropriate concep-tion under which to place an object, we seek for cases of a conception already before the mind, we realize our knowledge, clothing the abstract with circumstance, and learning its con-crete value and significance. I form an idea of honesty; but acquaintance with an honest man makes it more real. Diogenes went about with a lantern looking for a *man*. Instead of asking what a thing is, what name to give it, we ask who or what answers to a name. ' Who brought the parcel ? ' ' Who will o'er the downs with me ? ' But the answer to the question, though the grammatical subject, is the logical predicate. The *postman* brought this parcel (not the carrier). He who brought it is the postman. In all thought we begin at the one end or the other. Children open a remark with the words, ' Mother, you know so and so, don't you ? ' and, having fixed attention on subject or predicate, proceed to supply the other.

§ 263. Every predicate has itself been the subject of a preliminary judgement. We know a thing by bringing it under an acquired concept. But how was the concept formed and placed in the mind's store-chambers ? Ultimately we shall find that it is itself built up out of raw material in the shape of immediate presentations to consciousness [1] (the nearest approach

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[1] The relation between Sense and Thought, between the particular and universal, between the That and the What, says Mackenzie, is ' the

of experience to the purely undetermined and simply given) which are attended to by an act of will, and combined by an act of intelligence. The particulars, not being a mere series of *Thats* but having even in this rudimentary state a certain character and determinateness which relates them to our intellect, are unified, not aggregated. We are thus said to conceive (*concipere*).

§ 264. The Concept is itself a universal, being expressed, or, as some maintain, constituted, by a Common Name applicable generally to a number of objects. '*Homo*,' as Gadshill says, 'is a common name to all men.' This universality does not arise from the circumstance that the attribute connoted by the name has been observed in a number of differing objects; e. g. *flat* in table, floor, field, and the like—for it is sufficient for conception to have experienced the attribute once and once not—, but from the abstractive nature of the Intellect.

§ 265. Until Abstraction begins, Thought must be considered as not born, or at least as embryonic. Antecedent to Conception is Simple Apprehension, in which nerve modification passes into Sensation, and that into Perception. *Neurosis* becomes *Aesthesis.*

§ 266. A pool mirrors clouds and sky, but does not retain the image. The photographic plate retains the image which it reflects, but is not conscious of it.[1] It is sensitive, but not

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most fundamental antithesis in experience' (*Outlines of Metaphysics*, p. 93). 'Dualism accepts simply the antithesis as an ultimate fact; Idealism and Materialism arise from attempts to overcome it' (p. 91). 'Agnosticism represents the despair of any ultimate solution of the problem involved in it.' 'The fundamental forms of construction in the details of the sense-material are somehow brought to unity in virtue of some connecting principle' (p. 101). Contrasting perceptual with scientific construction, he observes: 'In perception we forget almost that any synthesis is involved. It seems at least as if the synthesis took place entirely on the initiative of the material itself. The possibility of illusions is the chief fact that reminds us that this is not entirely true. When we find that we have made a wrong construction, we can hardly ignore the fact that we have made a construction' (p. 100, cf. p. 95).

[1] Consciousness may be regarded as the Ego's knowledge that it knows: knows not its knowledge but itself as knowing. Locke says that we cannot *think* without knowing it: 'We might as intelligibly say that a man can be hungry without knowing it' (*Essay on H. U.*, book ii., c. i.). So Cousin: 'We not only feel but we know that we feel. . . . To think without knowing that we think is as if we should not think. . . . The fundamental attribute of thought is to have a consciousness of itself'

sentient. Even sentient creatures are not consciously aware of countless impressions which their senses receive at every moment. Were our powers magnified, we might hear musical notes of which the vibrations now fall on our tympana, but too fast or too slow to be perceived; we might listen to the grass growing, or 'die of a rose in aromatic pain'. Even those impressions to which we might attend by an effort of will— and volition is to some extent required for all consciousness— are not necessarily registered by the mind.[1] I instinctively brush away a fly from my face, or close my eyelids in a dusty wind, or stretch my chilled hands towards the fire.

§ 267. As yet the cause of the sensation is not, or is only imperfectly, discriminated from the Ego. I am conscious of a modification of the Real. When consciousness of duality begins, we have Perception.[2] An almost blind creature, for instance, is aware that something comes between it and the light, or, at least, is aware that its light is now here and now gone. Perception, so far, is still objective. It is awareness of existence. When the mind begins to take notice of its own operations, it is said to reflect, to find a unity in diversity. Perception becomes Judgement. I can distinguish myself from

(*H. of Modern Phil.*, i. 274, 275). Reid also. 'Non sentimus nisi sentiamus nos sentire' was a scholastic phrase. To be sure, consciousness is 'the common condition under which all our faculties are brought into operation'. Yet we often perform complicated mental feats quite absentmindedly. See Myers' 'Human Personality' *passim*. Again, if I necessarily know that I know, do I necessarily know, or necessarily not know, that I do not know?

[1] 'Facts show us that, if the attention of the mind be absorbed in other things, no impulse, though it amount to the laceration of the nerves, can produce in us the slightest feeling' (Morell, *Psychology*, p. 107).

[2] 'It may be doubted whether the element of duality is ever absent at any level of conscious experience. It may be that in mere sentience there is no such distinction. There may be such a condition of consciousness as is described by the word *coenaesthesis*, in which there is mere qualitative awareness without its being an awareness of anything. But it is difficult to attach any intelligible meaning to such a condition' (Prof. J. S. Mackenzie, *Outlines of Metaphysics*, p. 19). Yet, 'while it is true that all experience seems to reveal a fundamental antithesis [between Subject and Object], it is equally true that it never seems to reveal any separation. On the subjective side we never, as Hume puts it, "stumble on ourselves" in separation from a world of objects by which the more purely subjective state is conditioned. On the other hand the objective side seems equally inseparable from the subjective' (Ibid. p. 22). See *In Memoriam*, xlv.

this or that affection of my consciousness because I am not always affected in the same way. In Reflexion we subjectively make our own thoughts and feelings the object of our mental attention. 'I smell the blood of an Englishman.' Brutes cannot reflect upon their feelings, cannot classify them, but at the most associate them. Association, however, is not generalization. To suffer toothache, to localize the ache, to submit to have it remedied, to remember[1] it in a way, all this does not amount to an abstract conception of toothache. The use of words involves conception.[2] If I say, 'I feel warm,' 'I hear a scream,' 'I see a man approaching,' there must at any rate be already in my mind a general notion of warmth, of screaming, of man, and of approaching, as well as of feeling, hearing and seeing.

§ 268. Perception supposes a percipient. If the Mind is not a mere unretentive mirror, neither is it wax, nor yet a blank page, prepared or unprepared, which is passively written upon by the senses as scribes. Lord Herbert of Cherbury likened the mind to a book written within and without, but waiting for experience to open it and read. This is something like Plato's ἀνάμνησις,[3] sensuous impressions and experiences of the interior sense[4] merely giving the occasion to knowledge. But this inadequately expresses the active and creative energy of the Intelligence, reacting upon the deliverance of consciousness, combining in its secret laboratory the materials supplied to it by the senses, and bringing order out of unrelated impressions.

§ 269. According to Aristotle, the *intellectus patiens* perishes with the bodily organism, which supplied the matter of knowledge, whereas the *intellectus agens*, which gives form to knowledge, is imperishable. St. Thomas makes the same distinction. The one is a receptacle of sense-impressions, the

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[1] Without such remembrance punishment would have no effect. The flogging dominie observed that knowledge must be acquired through all the senses.

[2] See Mansel's *Aldrich*, lxi. n.e.

[3] 'Our birth is but a sleep and a forgetting,' &c. That the soul should have had an ante-natal pre-existence in God would not necessitate any doctrine of metempsychosis or reincarnation.

[4] Spinoza says : 'Nos sentimus experimurque nos aeternos esse.'

other a recipient of ideas, comprehending as well as appre-
hending.

§ 270. The senses by themselves do not even perceive, far
less conceive. As Plato remarks, we do not see by the eyes,
but through the eyes. Aristotle says :—νοῦς θεωρεῖ, ὁρᾷ, θιγγάνει,
ἀκούει. He speaks of a Common Sentient, ἕν τι κοινὸν αἰσθητήριον,
a central faculty by which the reports of the organs about their
own objects—and it is more correct to speak of a plurality of
organs than of faculties—are reduced to the unity of a common
apperception. Hobbes and others call it the 'common sense'.
But the unifying centre is rather sensibility than sense or sen-
sorium. A sensorium may be purely physical—grey medullary
substance, or the like. But sensibility is the mind receiving
impressions through the senses under certain subjective con-
ditions. The message from any part of the body to the brain,
apprising it of some lesion or affection, is stopped by an
anaesthetic. Lewes agrees that all knowledge must have an
a priori element, but reduces this to 'the virtual capacity of the
knowing mind'.[1] We were not born with reason, but with
capacity for learning to reason.[2] Yet he is clear that the
faculties could not have been evolved out of sense-impressions,
and that what *perceives* is the *mind*.

§ 271. Perception is not an activity exercised by a higher
faculty upon a lower, but is the Self focussing its impressions.[3]
The Ego is to itself a unity amid the world's manifold. Yet
we distinguish the Sensibility from the Intelligence. What
the former is to objects of perception, the latter is to objects
of thought. The intuitional activity of the mind passes into
an ideational activity, in which the mind reflects upon its earlier
operation. 'Intuitions without concepts are blind';[4] while, con-
versely, concepts without content are void. Condillac asserts
that 'Penser c'est sentir'. According to him all the faculties
are only sensation transforming itself differently. This view
will not stand. Yet Sensibility and Understanding cannot be

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[1] *H. of Phil.* ii. 484.

[2] Ibid. p. 361.

[3] Lamartine says :—'Ce n'est pas moi qui pense ; ce sont mes idées qui
pensent pour moi.' But he does not mean this for serious psychology.

[4] Lewes, *H. of Phil.* ii. 496. Just before (p. 494) he quotes Hegel
(*Encykl.* § 24)—' Man is always thinking even when he is intuiting.'

parted. We neither apprehend the universal first, nor the particular first, but both together, the former in the latter.[1]

§ 272. No fact stands isolated. 'Of a pure concrete we have no experience.'[2] Every perception is a bundle of generalized sense-impressions. What the understanding does is to separate between the *here and now* of a percept and its general relations. It abstracts. Abstraction is the intellectualizing of a consciousness of difference and agreement. Two (or more) presentations to consciousness are perceived to be the same, yet not the same. It is not at bottom of consequence whether the comparison is between two (or more) objects, exhibiting a similarity in diversity —as when eyes, the sky, the sea, a violet, are all noticed to be blue—, or between two (or more) phases of the same object— as when the sea is observed to be blue, green and grey. 'Wine-coloured,' a Homeric epithet of the ocean, may be regarded either as one aspect of the sea—difference in unity—, or as a resembling quality between the sea and wine—community in difference.

§ 273. Consciousness requires transition. Bain remarks :— 'To make us *feel*, there must be a change of impression ; whence all feeling is two-sided. This is the law of Discrimination or Relativity. Observation shows that unbroken continuance of the same impression is attended with unconsciousness. An unvarying touch or a monotonous sound ceases to be felt. In an even temperature we lose all consciousness of heat or cold.'[3] A lizard or other creature which is exactly like its surroundings is practically hidden from the observer, even though he be intently gazing at it. The flame of a match ·is invisible in broad sunlight. The music of the spheres, supposed continuous and perfectly harmonious, is unheard.

§ 274. But all consciousness also implies some perdurance. If the changes of sensation were infinitely quick, so that the sense received a continual rush of fleeting impressions, the mind would perceive nothing. The impressions must have some unity,—as colours melting swiftly into one another are all perceived to be colour—, and the percipient mind must have some retentive power. What is wanted is not consciousness of

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[1] 'Alio modo [substantia] universalis est quum cogitatur, alio singularis quum sentitur' (Boethius).
[2] Bain, *Logic*, Pt. I. p. 7.   [3] Ibid. Pt. I. p. 2.

transition at the moment it takes place—for daylight may die by fine gradations into darkness, or a hard substance become soft, without our apprehending any dividing line between the two—, but rather memory—Bishop Hall's 'custos rotulorum'—, enabling the mind to compare a past with a present impression.

§ 275. We see, then, that consciousness is of a one in the many and of many in the one. The understanding, or *cogitatio abstractiva*, invests a point of resemblance with an intellectual character, and viewing it as quality (*qualitas*) regards it necessarily in the light of a universal, which is indefinitely reproducible and entitled to a common name applicable to an indefinite number of objects. Memory, if merely (as with Hobbes) a decaying sense, could not produce general notions, nor could these be generated by simple iteration of sensations. 'Music, when soft voices die, vibrates in the memory.' Condillac regarded memory as literally the tendency of the brain fibres to vibrate in the way they have formerly done.[1] Hartley developed the vibration theory. Erasmus Darwin taught that recollection and imagination are but 'a repetition of animal movements'. An exploded materialism, however, need not here be discussed. There cannot be αἴσθησις αἰσθήσεως. The notice which the mind takes of its own operations and acquisitions cannot be explained in terms of sense—sense does not distinguish or unify. By the eye, by bare inspection, we could never discriminate the shape of a piece of ice from its transparency.[2]

§ 276. We have endeavoured, then, in the foregoing paragraphs to suggest the psychological genesis of Conceptual Thought. The human understanding notionalizes impressions, and, viewing every attribute as a quality, gives it a *general* character, and thus *conceives* it.

§ 277. It is usually said that Abstraction precedes Generalization. Abstraction is the withdrawal of the mind from all the qualities of an object except one [3]—though this is only possible

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[1] *Logique*, c. ix. pp. 82 seq.

[2] See McCosh, *Discursive Thought*, p. 4.

[3] 'Drobisch observes that the term *Abstraction* is used sometimes in a psychological, sometimes in a logical, sense. In the former we are said to abstract the attention from certain distinctive features of objects presented (*abstrahere a differentiis*). In the latter we are said to abstract certain portions of a given concept from the remainder (*abstrahere*

when those other qualities have not invariably been experienced in conjunction with it : if I lived immovable and with fixed gaze in a world made entirely and uniformly of blue ice, I should be unable, perhaps, to discriminate cold from colour.   Generalization, on the other hand, recognizes a common quality or circumstance in several objects otherwise diverse.   But these are really the same mental operation.   If it is possible to make abstraction of a single property of a single object, this is because the other properties of the object can be varied, the one remaining the same.   The moon is the moon whatever its shape or place in the sky.   This is abstraction.   Again, a child has a general idea of lessons, running through the variations of reading, writing, arithmetic, geography, Latin, drawing, music, and the rest.   (If no child ever did any lessons but sums, the two ideas might seem inseparable.)   Is this abstraction or generalization, or both ?[1]   If the world were a plain with a single mountain in it, I could obtain as good an abstract idea of 'mountainous' as if I knew a hundred such.   If the mountain is sometimes in eruption and sometimes not, the general idea of eruption is as clear to me as if the mountain were part of a volcanic chain.   I may live by a single river crossed by a single bridge, with a single cataract, and inhabited by a single crocodile. A man may never have seen but one railway.   A child may know but one cat.   But am I or they in the least surprised if river, bridge, cataract, crocodile, railway or cat be found repeated elsewhere ?   It is the essence of a general notion to cover an indefinite number of cases.   Even an object *sui generis*, or necessarily individual, is known under various circumstances and in different connexions, and so can always be regarded under the aspect of unity in diversity.   Yesterday's, to-day's and to-morrow's moon—the moon being thought of by most people as a unique object—are practically three moons.   There

differentias).'   Mansel, *Prol. Logica*, p. 25 n.   It is the former we are here concerned with.

[1] Whately gives as an example of abstraction without generalization a man's attending to the scent of a rose—the only one he had ever met with —disregarding its colour, form and the like.   But he can do this because he regards the rose-fragrance as a permanent property of the flower, which would possess it equally in the dark ; or because it lingers in the memory, 'living within the sense it quickens.'   It has thus a general character, perduring through differences.

is but one 'God that judgeth the earth'. There is only one centre of the material universe (if finite). But these readily become notions.

§ 278. It appears, therefore, that to recognize that several objects have a common attribute, and to recognize an attribute as constant in one object under varying conditions, are really the same recognition. To consider a quality by itself is necessarily to view it in an abstract and general light. 'Whatever is received by the intellect is supra-sensible.'[1] Aristotle says :—
αἰσθάνεται μὲν τὸ καθ᾽ ἕκαστον, ἡ δ᾽ αἴσθησις τοῦ καθόλου ἐστίν, οἷον ἀνθρώπου ἀλλ᾽ οὐ Καλλίου ἀνθρώπου.[2]

§ 279. But though it is at bottom the same thing whether I recognize a similarity between several objects, or say, 'This is what I have observed before under other circumstances,' it is much easier in the former case to *classify* and *name*. To do this we must refer the phenomenon to an existing category. We know one object only by knowing others. 'Nought do they know of England who only England know.' We can only say what a thing is by saying that it is something else. 'Fire is a good servant.' 'This is a Norman arch.' Now every concrete falls potentially under as many classes as it has attributes. An orange is round, yellow, juicy, and so forth. These classes have names. But many sensations, savours, scents, sounds and unique experiences have no name.[3] We say, It is a *je ne sais quoi*, a *nescio quid*, a something or other, a kind of feeling or taste, a sort of look, an indescribable perfume, about which it is not easy to compare notes with other people. It is an affection of a certain sense, but the *differentia* cannot be named. In *King Henry the Sixth* (Part II), Simpcox, who pretends to have recovered his sight by a miracle, is detected even by the simple king for a cheat when he names the colour of Gloucester's gown—'Black, forsooth; black as jet.' How was he acquainted with the category 'black'? If a person were to set about commenting on Shakespeare, with no previous study of general literature, of words, customs, institutions and history, he could

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[1] Clark, *Logic*, p. 99.   [2] *An. Post.* i. 100ᵃ 15.
[3] Manna ('which thou knewest not, neither did thy fathers know,' Deut. viii. 3) was the name given by Israel to the bread from heaven, 'for they wist not what it was'—the word meaning either 'What is it?' or 'a portion'.

contribute little more than, 'This is a fine passage'; 'This scene appeals to me,' and the like—mere blue-pencil annotation. Very complicated things, as well as very simple ones, are difficult to name—a character, a position of affairs in history or politics, a piece of mechanism, a work of literature. Uneducated minds, in all classes of life, have a very limited vocabulary; though in an older state of society common folk were wonderfully shrewd in noting picturesque analogies, and their talk was rich with proverbial lore.

§ 280. When we proceed to ask how names originated, we meet an insoluble problem. Are they, since a rose by any other name would smell as sweet, purely conventional? That a mark once affixed to a class of objects having a certain characteristic would quickly extend itself, analogically, to numerous other classes is obvious. Weather, features, a poem, conduct, an ideal, a scarce-discriminated difference, are alike called 'fine'. 'Sharp' is applied to a spike, a tooth, the wind, a shrewish tongue, temper, wit, musical tone, and the like. Whatever satisfies the canon of taste—a plump pig or a good cigar as well as Cleopatra's face or a saint's death—is called 'beautiful'. In the rustic idiom 'terrible' (δεινόν) is a word for anything that excites admiration—e.g. 'a terrible one at Scripture and that'. But how did the name come to be given in the first instance? Philologists speak of some 120 'predicative' roots, to which must be added a few 'demonstrative' or 'pronominal' radicals, at the actual disposal of human language.[1] Max Müller holds that every one of these mother-sounds expresses a general idea, and (with Leibnitz) that names of individual objects or persons were originally appellative—e.g. George Cooper, Mayfair, Lent, moon, earth—, whereas Nominalist thinkers (e.g. Locke, Condillac, and Adam Smith) uphold the contrary view, that all names were originally proper names. Of course there are many such—e.g. palace (Palatium),

[1] Max Müller, *Lectures on the Science of Language*, ninth edition, i. 306-10, 441, 442. With the twenty-four letters, however, the number of possible biliteral and triliteral roots would amount to 14,400. The actual combinations of the four-and-twenty is calculated by Leibnitz at 620,448,701,733,239,739,360,000 ! In a monosyllabic language like Chinese, there is no formal distinction between noun, verb, adjective, adverb and preposition. A Chinaman finds it difficult to conceive a language in which every syllable is not significative (ibid. pp. 332, 377).

hansom, boycott, pasquinade, Bradshaw, brougham, Gladstone, lazar, maeander, currant. But how did proper names originate? When we go further back we come sooner or later to a root expressing a general notion. 'All naming is classification,' and—except perhaps the handful of demonstrative roots —'every word is originally a predicate.' The old view that brutes are without articulate speech because they cannot form general conceptions seems perfectly philosophic. They are ἄλογα, without λόγος.[1]

§ 281. It will occur to every one that, if it is impossible to form general notions without having names to give them, if sign must precede cognition, the names must have been given to general notions by those who as yet had no general notions. This is like the question, which came first, hen or egg? If language were literally an arbitrary convention, the philologist would be posed. We are forced to believe that thought and speech were evolved, or given, together, as two sides of the same thing.

§ 282. The advocates, indeed, of the Onomatopoetic and of the Interjectional theories of the origin of Naming consider that names were supplied to man ready-made, by imitation of the sounds of the world around him, or by his own involuntary noises. Such words as crash, clank, crunch, hum, mugire, balare, σίζειν (the word used by Homer for the sound made by the red-hot pine-tree when dropped into Polyphemus' eye), are samples of a host of mimetic words. The nursery is rich in them; so also is slang ('ticker,' 'fizz,' &c.). Max Müller, as every one knows, ridiculed this as the *bow-wow theory*. Ono-

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[1] 'Whatever we know, we know it only by means of our general ideas. Other animals have sensation, perception, memory, and, in a certain sense, intellect; but all these, in the animal, are conversant with single objects only' (Max Müller, *Lectures on the Science of Language*, ninth edition, i. 433). Accordingly 'the one great barrier between the brute and man is *Language*. Man speaks, and no brute has ever uttered a word' (ibid. p. 43). The writer quotes Descartes and Locke (ibid. pp. 399, 405) as to the fundamental difference between the mind of a beast and the mind of a man. Yet Locke did not regard language as necessary to thought. To the ancients talking oaks (προσήγοροι δρύες) did not appear more monstrous than utterance from ox ('bos locutus est') or horse. When Achilles' horse speaks, the portent is repressed by the Erinnyes, as guardians of the cosmic order (*Il.* xix. 418). In the Book of Numbers the abuse of reason (παραφρονία) by a prophet, to whom the gift of utterance has been given above other human beings, is rebuked by speech in the mouth of the least intelligent of ἄλογα ζῷα.

matopoeia accounts, he argued, for only a certain proportion of words; and, 'though *a* language might have been made out of the roaring, fizzing, hissing, gobbling, twittering, cracking, banging, slamming, and rattling sounds of nature,' language as we know it had a different origin. The Interjectional hypothesis he called the *pooh-pooh theory*, for 'language begins where interjections end '.[1] Professor Sayce suggests the 'ding-dong' theory—that man responds to the impressions of nature like a bell that is struck.

Max Müller, however, makes scarcely an attempt to explain how names *did* arise. Roots, or phonetic types, 'are simply ultimate facts.' He has to fall back on a mystical or theological explanation. ' We might say, with Plato, that they exist by nature; though with Plato we should have to add that, when we say by nature, we mean by the hand of God—θήσω τὰ μὲν φύσει λεγόμενα ποιεῖσθαι θείᾳ τέχνῃ.'[2]

§ 283. Even though all language is 'by nature', yet we have to distinguish 'natural' from 'artificial' modes of expression: not merely cries and gestures from grammatical speech, but painting, sculpture and hieroglyphics from writing, telegraphy, and the like. When we see three balls we *infer* a pawnbroker's; when we see a wooden Highlander a tobacconist's; a bush over the door signifies a wine-shop. These are representative signs. But a bootmaker's is presentatively indicated by boots in the window, a grocer's by sugar and raisins. Again, some language may be purely κατὰ συνθήκην, as a burglar's signal to his accomplice, or calling for trumps at whist. Contrast Blondel's minstrelsy, by which King Richard knew in prison that a friend was near; or the flute which told the besieged in Montauban that relief was at hand. In the *Rehearsal* much was conveyed by a shake of the head—'vox quaedam est animi corporis motus.'

§ 284. Words tend in course of time to become mere tokens,

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[1] *Lectures*, i. 419, 420.

[2] Ibid. p. 439. Some of the Greek Fathers held that paradisal Man was only dowered with a power of nomenclature, not with a stock of words and syntactical constructions. The origin of Grammar takes the inquirer into the profoundest recesses of the human intellect. It is the earliest philosophy of the race: hence the possibility of a universal Grammar. The first attempt at a ' Grammaire Générale et Raisonnée' was that published by Arnauld and Lancelot of Port Royal in 1660.

losing their intrinsic and acquiring a merely conventional value. Every language, it has been remarked, begins as poetry and ends as algebra. A Bill 'runs the gauntlet' of criticism. To be clapped is to ' receive an ovation '; to think is to ' labour under an impression '; a scrape is a predicament, a madman is a lunatic, a smile bewitches, a debtor is bankrupt. Every second word we use in modern speech is a slipshod metaphor of which we have forgotten the meaning. Hence the austere educational value of Latin composition.

Place-names have all, no doubt, had at one time a general significance ; e. g. Cologne (colonia), Edinburgh (Edwin's burgh), Bradford (broad ford), Kirkcudbright (Cuthbert's kirk), Essex, le Hâvre, Weymouth, Bath, Wells, Haymarket, and the like.

§ 285. Proper names may be used representatively as common names ; as when we speak of playing the Lady Bountiful, of a village Hampden, of a Daniel come to judgement, a Roland to your Oliver, a modern Bayard, a little Eden. Boniface comes to mean an innkeeper ; Rosinante a lean nag ; Edwin and Angelina stand for a young married pair ; Jacques Bonhomme is a French peasant ; Tommy Atkins an English private ; Ivan Ivanovitch a Russian conscript. Or an individual may be thought of as capable of multiplication. ' If I had business at Leipzig,' boasted Luther, ' I would ride into Leipzig though it rained duke Georges for nine days running.' Again, where a concept is highly complex we often personify it—John Bull standing for the English character, Father Christmas for Yule-tide festivities, Pomona for the rural scenes of autumn. Abstractions like liberty, empire, industry, agriculture, are conventionalized in art by an individual figure bearing certain emblems. Authority, old and blind, is pictured by the poet as beating with his staff the child that might have led him, or Laughter as holding both his sides. Truth is shown by the sculptor tearing out the tongue of calumny. Time is an old man with scythe and hourglass, or 'has a wallet at his back '. Opportunity has a forelock, but is bald behind—'fronte gerit crinem, post est occasio calva.'

§ 286. To say that an individual can only be conceived by becoming generalized is as much as to say that there can be no idea of a fact indicated as such. A united Italy is a conception, but an Italy in fact united is a presentation to consciousness.

Place can be thought of conceptually because it is not a naked *there* or *here*—not even 'the point midway between Bath and Bristol'—but it has local colour and circumstance, which might be repeated elsewhere, or indeed may have no geographical reality at all—like Utopia with its stream the Anyder, or like the Hesperides, or the castles we build in Spain.   Settlers in new lands try, like Aeneas' followers, to reproduce the familiar places of home.   Less easily can time be idealized.   The externals of a period, no doubt, may be reproduced—cinque-cento, Elizabethan, Louis Quinze; the 'brave days of old' might conceivably return in a golden cycle; but 'now' or 'last Tuesday' can by no possibility be anything but now and Tuesday last.   Of course, since time's stream is for ever running beneath the bridge, there is, in one sense, an endless succession of *nows*, of present standpoints.   'A fortnight hence' to-morrow will be a different date from 'a fortnight hence' to-day.   In this sense there is a general idea of *nuncitas*.   But not of the actual, the asserted, demonstrative *now*, the 'now' to me who am judging and speaking.[1]   I must stand off my own shadow, so to speak, to make categorical indication notional.

§ 287. A real event can be depicted on canvas or otherwise in all its circumstances—place, persons, action and the suggestion of date—like the past fortunes of Troy which Aeneas saw on the walls of Dido's palace, or the future history of Rome represented on the shield wrought by Vulcan.   And what is pictorial, whether it be of an existent thing, as London Bridge at midnight, or a non-existent thing, as a hundred-headed giant, is ideal.   But a picture asserts nothing.   Hence *tense* enters into predication only as itself predicated.[2]   It does not modify the assertive energy of the sentence.   There are not different kinds of assertion—past, present, future, perfect, pluperfect, &c. See below, § 612.

§ 288. But though 'in perception the object known is always a single determinate object',[3] no judgement about fact can be purely concrete, for every judgement involves inference.   The

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[1] 'So long as we keep a demonstrative, spatial or temporal, reference in the thought, the subject of judgment is not cut loose from our personal focus of presentation' (Bosanquet, *Essentials*, p. 62).

[2] Aristotle, after defining a name as φωνὴ σημαντικὴ κατὰ συνθήκην ἄνευ χρόνου, goes on to recognize tense in the verb (*De Interpr.* 2. 1).

[3] Hamilton, *Lectures on Logic*, i. 75.

fact is judged in the light of theory. And, further, the proposi-
tion is the interpretation in words of the judgement. ' I am
watching the sun setting.' ' I saw the conjuror put the card into
the pack.' We place sensations under descriptive conceptions ;
and it is here that error enters.

§ 289. Similarly, the very naming of an individual object is
never wholly concrete. It is assumptive, and in some degree
theoretic. ' Your brother Richard ' assumes that you have a
brother, and that his name is Richard. Simple ' Richard '
assumes that there is a person so called, and that to-day's
Richard is the same person as yesterday's. Ἐκεῖνος, ' that person
over there ' assumes that there is a person over there ; while
pointing with the finger involves the idea of digital indication.
To get to the *primum cognitum* of the pure Concrete the Ego
must go behind even the simplest judgement to the original and
speechless conviction of its own intuitional modification, of
Reality as determined for me. No explicit judgement can
be without an element of abstraction. We cannot think without
generalizing.

§ 290. As conception implies experience, so nothing can be
an element in a concept which cannot be pictured to sense
or imagination. The notion is οὐκ ἄνευ φαντάσματος. Yet it
is in itself ideal and universal. Hence connotation precedes
denotation. A castle is every building which is castellated ;
and, though empirically the number may be limited, the limit
is a material one only. There might be infinite millions of five-
act tragedies existent, if it so happened.

§ 291. The concept, then, having an ideal universality, cannot
be pictured or imaged as a concept, but only through some
representative individual of the class, which must needs appear
with individualizing characteristics. A clock must be shown,
or imagined, as grandfather clock, Dutch clock, church clock, or
otherwise ; circle as of a certain diameter ; flower as of some
shape and kind.[1] The universal is realized in the individual.

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[1] Artemus Ward's versatile wax figure which had stood for so many
celebrated characters was pronounced by critics not to look like one
person more than another—in fact, not like anybody that ever lived.
This, the showman claimed, was what made the effigy so remarkable,
and well worth paying to see. Still, it could not have done duty for
mankind generally without being the representation of a possible

The individual is known through the universal. I know this figure to be a rectangle because each of its corners is a right angle. 'This rose' combines intuition with idea—either, the rose concept here and now realized, or this object possessing the rose attributes. 'Our dog' indicates a definite dog. 'A dog of ours' the same if 'a' means 'a certain', but an ideal dog if it means 'any'.

§ 292. There was a street in Paris a generation ago which, having been called Rue de la Reine, and then Rue de l'Impératrice, had its name altered again to Rue de la Maréchale Macmahon. Some one then suggested that, to obviate the need of future changes, the street should be permanently designated, Rue de la Femme du Chef du Pouvoir Exécutif.

§ 293. Intellection of the common or constant amid diverse presentations to consciousness gives us, then, the Concept or Notion, the Common Name of which signifies 'possessing an attribute', either as qualifying adjective—e. g., blue, circular—or as substantive (reality qualified thus or thus)—e. g., child, circle. The connoted attribute—blueness, childhood, circularity—is necessarily substantive, and can never, except seemingly in identifying judgements, be a predicate. Possession of it is the ground to any object for sharing in the common name and coming under the concept-class, which consists of all the actual and possible objects which have the attribute.

§ 294. 'A', 'an' (Scots *ane*, German *ein*, French *un*, Latin *unum*), mean, of course, *one*. 'A dog is an animal' means 'Any one object characterized as dog is some one object characterized as animal.' We shall see below under 'Judgement' the reason for the difference here between subject and predicate.

§ 295. Every Concept is really a complex consisting of a substantival and an adjectival element. In the ultimate analysis the substantival element is Substance, or Reality, which is qualified in the way indicated by the name. But, without carrying analysis so far, we have little difficulty in breaking up ordinary concepts into these two elements ('thrush' is the thrush kind of bird, a bird having the thrush characteristics),

individual, any more than the 'portrait of a gentleman' in our exhibitions. General names are possible, but not general images.

while many concepts are either compounds (as tea-caddy, engine-driver, bluebell, wryneck, woodpecker), or actually consist of a substantive and adjective, or a substantive qualified by a dependent clause, or by another substantive used adjectivally (as muffin-bell, stone wall).

§ 296. Not all adjectives or adjective clauses, however, are so in the sense of being restrictive and determining. They may be epithetical or appositive. Contrast 'roast fowl' with 'feathered fowl', 'good men' with 'mortal men', 'nobleman' with 'noble lord', 'learned member' or 'learned pig' with 'learned counsel', 'learned member' with 'honourable member', 'peace with honour' with 'meek-eyed peace', 'the cup that cheers but not inebriates' with 'wine that maketh glad the heart of man', 'injured innocence' with 'heaven-loved innocence', 'fallen seraph' with 'sworded seraphim'. 'Port which is unadulterated is wholesome' is not parallel to 'port, which is a red wine, is shipped from Lisbon'—observe the commas. Epithetical adjectives are common, of course, with proper names and in poetry — 'coaly Tyne'; 'silver-streaming Thames'; 'black-browed night'; 'ignis edax'; 'gold-dusted snapdragon'; 'towered cities'; 'Genova superba'; 'knotty oaks'; 'wind-changing Warwick'; 'great Anna'; 'ivy never sere.' In 'right reverend prelate' the adjective is assumptive, not conditioning, except that by usage it excludes archbishops. 'Merry Christmas' is not parallel to 'a merry Christmas', nor 'leafy June' to 'a wet June'. Appositive expressions are of frequent occurrence—'Knowledge, the wing wherewith we fly to heaven'; 'sweetest Shakespeare, Fancy's child'; 'spare Fast, that oft with gods doth diet'; 'daisies, those pearled Arcturi of the earth'; 'bluebells trembling by the forest ways.' Adjectives attached to abstract names are usually ornamental—'sour severity,' 'sweet seventeen,' 'youthful jollity.' In naïve and childlike poetry, such as Homer or the ballad, they recur with quaint irrelevance. In the *Odyssey*, for instance, even the traitor Aegisthus is ἀμύμων (i. 29). Complimentary titles like 'right honourable' are of this kind. And since every epithet is an assumption, such adjectives follow the definite article or demonstrative pronoun, and but seldom the indefinite article—'the splendid Vandyck,' 'your fair daughter,' 'yonder green tree.'

§ 297. Logic cannot tell whether an adjectival expression is

descriptive or determinative, except that the voice lays a slight stress upon any determining element. In pronouncing 'bonny red gold,' 'dishonest rogue,' 'yellow guineas,' 'simple Susan,' the emphasis is almost even, or, if anything, lies on the substantive, since all guineas are yellow but not all yellow things are guineas. But in 'red rose,' 'dishonest trustee,' 'yellow hair,' 'simple remedies,' it is on the adjective. 'Green' qualifies dress but describes grass. 'The guilty boy shall be punished' could either mean 'the boy, being guilty, shall be punished' (ἀδικήσας ὁ παῖς κολασθήσεται) or 'the guilty one among the boys' (ὁ παῖς ὁ ἀδικήσας), according as a trifling accentuation were laid on the word 'boy' or 'guilty'.

§ 298. In examining the development of the Concept into the Judgement, we shall see that descriptive adjectives become the predicate of a universal judgement—'mad Tom' implies that Tom is mad, 'tinkling rills' that all rills tinkle, 'foul fiend' that every fiend is foul. This is obvious in the case of appositive phrases—'sweet-william with his homely cottage-smell', 'the gods whose dwelling is not with flesh.'

§ 299. On the other hand, adjectival expressions which qualify a noun restrictively develop as a particular judgement, and at the same time imply the 'sub-contrary' judgement. 'Well-printed book', 'contented age', give us *when realized* 'some books are well printed', 'age is sometimes contented', but imply as a fact that some books are not well printed, and that age is not always contented. 'Well-printed Aldine', on the other hand, is a description, for all Aldines are printed well. In 'high-elbowed grigs, that leap in summer grass' we find implied not only a universal, but a convertible one. But this we only know materially.

§ 300. The fact that a 'sub-contrary' proposition is implied by any qualifying and conditioning expression enables a person to argue that if a thing is denied or condemned under a certain aspect it is admitted or allowed under other aspects. Thus Newman in Tract XC showed that condemnation of the *doctrina Romanensium* concerning purgatory, pardons, &c., involves recognition by the Article of a Catholic doctrine on those points. If XY's are denied some other Y's are granted. An exception, or qualification, stated as such, proves the existence of a rule. 'I do not leave the office on Fridays till six' implies that on

other evenings I leave earlier.   A dispensation implies a law to the contrary.

§ 301. Since universal propositions are contradicted by particular ones, and vice versa, epithetical positives are opposed to determining negatives, and epithetical negatives to determining positives—'immortal gods' to 'a mortal god', 'irresponsible, indolent reviewers' to 'a reviewer who is neither irresponsible nor indolent'.   Wordsworth's lines—

> Heaven out of view, our wishes, what are they?
> Obsolete lamps, whose light no time recalls,
> Urns without ashes, tearless lachrymals—

imply that as a rule all urns contain ashes and lachrymals tears, and that lamps are meant for light.   But, 'obsolete' standing before 'lamps', the phrase 'whose light no time recalls' becomes merely epexegetical.

§ 302. Particular negative can be true at the same time as particular affirmative judgements.   Accordingly, while the ideas of deadly and of venial sin, of important and of unimportant news, are opposed, the things can and do coexist in reality. Descriptive epithets, on the other hand, suggest an assertion, and therefore exclude a contradictory description.   'Royal-towered Thame' assures us that the Thames is not lined throughout with gasworks, soapworks and smart villas.   Contrast 'good Queen Bess' with 'a discrowned Lear'.   The latter is an idea; the former only a fiction.

CHAPTER X

INTER-RELATION OF CONCEPTS

§ 303. WE are now, having analysed the Concept, in a position to examine further the inter-relation of its elements, and of concepts among themselves. For if every concept consists, either openly or implicitly, of a substantival and an adjectival element, that is as much as to say that every concept is composed of one concept qualified by another; e. g., salt water, hydrostatics, waistcoat, madman, halfpenny, hen (hen bird). No doubt, an enormous number of common names are a simple word (pen, book, boat, &c.). But, as already observed, every such word either implies some generic class of which it is a particular sort, or at least, ultimately, it is a qualification of *thingness* or reality. Etymology will often make this clear. Thus, hell is the covered (place).

§ 304. Concept qualified explicitly by concept is the potential definition of any simpler concept which is its equivalent. If we wish to define a name we find some higher concept under which to range it, some higher class under which the objects named fall, and then seek so to qualify that higher concept, so exactly to mark off a portion of that class, that equivalence is established. Regarded extensionally as the delimitation of a class, Definition may be represented by the intersection of two circles.

§ 305. For different purposes, however, a concept has different definitions. It may be conceived from as many points of view as the thing conceived has attributes—see below, § 386—each of these forming a higher concept under which it can be ranged. And since each higher concept falls in turn under superordinate concepts, there results a chain, or rather network, of generic and specific concepts.

§ 306. In defining, we select the most important and characteristic attributes for the purpose in hand. We should be unlikely to define a motor carriage as a movable machine

which is bound by law to carry a visible letter and number, nor a postage stamp as a picture of the Sovereign an inch square. But, whatever the definition I select, that is, for the moment at any rate, my conception or notion of the thing. The notion is thus not anything fixed, but subjective. On the other hand, a definition propounded to others implies a common ground of possible agreement as to the content of the notion.

§ 307. Regarding definition as the intersection of two spheres, it is obvious that the class defined falls wholly within both those spheres. If a ship is a navigable dwelling, every ship is a dwelling and every ship is navigable. Sometimes one of the spheres falls entirely within the other, coinciding with that of the *definiendum*; in which case the attribute which marks the former is a *proprium* of the class defined; as if a man is defined as a food-cooking animal, or real estate as landed property— though, to be sure, land is sometimes unappropriated: the light soil of the Sahara, for instance, or the polar regions. But definition by genus and property is not good definition.[1]

§ 308. In respect of their mutual relations, Concepts are divided as :—

(1) Mutually exclusive (kind, cruel; plant, mineral).

(2) Co-extensive (equilateral, equiangular; faithful, hereafter to be rewarded).

(3) Subordinate and superordinate (wren, bird; clock, useful invention).

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[1] It is surely by an oversight that both McCosh (*Discursive Thought*, p. 103) and Veitch (*Institutes of Logic*, p. 195) assert that a differentia must be convertible in extension with the species. McCosh gives as an illustration, ' Mammals suckle their young' ('Mammals are viviparous animals' would be better). Such a rule would exclude most definitions, though definitions relating to natural kinds, and some mathematical ones, often comply with it. We might define schooner as a two-masted ship, though the sphere of 'two-masted' falls entirely within that of 'ship'. The objection to the *differentia* being a *proprium* is that, for diagnostic purposes, such a definition might dispense with the genus altogether. Why not say, 'a schooner is an object with two masts'? This would bring us to definition through a commensurate attribution. ' L'État c'est moi' was meant to define the State. 'Homo est animal rationale' has an absolute differentia if St. Thomas is right in saying that the angels are not *rationales* but *intellectuales*. The Christian Platonists held demons to be rational and also animal, adding 'mortal' for the definition of man, as the Greeks, to whom the gods were ζῷα, had also done.

(4) Co-ordinate (wren, finch, robin; clock, sundial, watch).

(5) Intersective (kings, philosophers; vocal music, good music).

§ 309. I have hitherto tried to avoid the expressions Genus, Species and Differentia, which belong to the classifications of natural philosophy rather than to Logic. The qualified concept in a definition may be called Genus, and the qualifying concept Differentia. But, except in the case of a *proprium*, where the qualifying sphere falls altogether within the qualified sphere, it is impossible for the mere logician to say which is the generic and which the differentiating idea. The circles intersect. Differentia, therefore, may be regarded as genus and Genus as differentia.[1] Man is a rational animal; that is to say, he is a rational among animals, and an animal among rationals. The circumstance that grammatically the differentia is adjectival is of no consequence logically.

§ 310. Again, the subjects and predicates of ordinary speech can hardly be dignified, even when we define, as Species and Genera. Flirtation has been defined as attentions without intentions. Flirting is a *kind* of attention; but we should not call it a species of that genus. At the same time, the phraseology is convenient, for want of purely logical expressions. We shall then say that every division of a whole class, whether it has a name to itself or not, stands to the whole class in the relation of species to genus. A white cat is a particular kind of cat; a faded scarf is a scarf under specific circumstances; love in idleness is love circumstanced thus and thus; cupboard love is generic love so differentiated as almost to destroy its character.

§ 311. By qualifying a concept we make it more concrete.

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[1] In 'A quadruped is a four-footed animal' *four-footed* seems obviously to be the distinguishing characteristic. But suppose the question to arise whether a table with four legs could be called a quadruped, as one with three is called a tripod. No, it would be replied; a quadruped is a four-footed *animal*. 'Animal' here is the logical differentia, not the genus. The distinction that Genus is predicated of Species 'in the category of substance' and Difference 'in the category of quality' is merely grammatical, not logical. 'Conscience is an inward monitor' might be expressed 'is something within us which warns'. A pupil-teacher is a teacher-pupil, a rainy drizzle is a drizzling rain. On the other hand a *libre-penseur* is not necessarily a *penseur libre*. Quarles says :—' Be wisely-worldly, be not worldly-wise'; and Tennyson warns us against thinking that man-woman is woman-man.

Chop is more abstract and further from experience than veal chop, play than play of Shakespeare. This is also stated by saying that every additional determination of a notion produces an enlarged Intension or Comprehension and a contracted Extension or Sphere. The new notion implies, or connotes, more qualities than the old one, but applies to, or denotes, fewer objects. There are more tradesmen than haberdashers. The predicate, then, of a universal judgement has fewer attributes but a wider extension than its subject—unless, indeed, they chance to be convertible; e. g., 'A modern regiment has ceased to take its colours into battle.' The following exhibits to the eye an intension enlarging with each new qualification :—

<div align="center">

Man
|
Seaman
|
One-armed seaman
|
Young one-armed seaman
|
Brave, young one-armed seaman
|
Thrifty, brave, young one-armed seaman

</div>
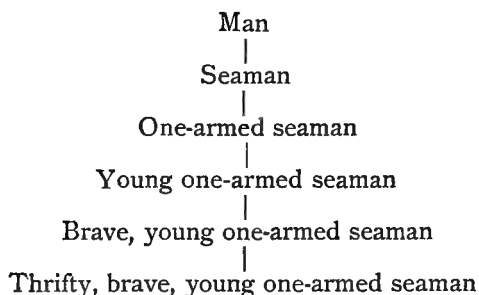
A number of circles enclosed one within another, of which 'man' should be the largest, would exhibit to the eye the diminishing extension.

§ 312. If we qualify a concept negatively, what is the effect on its intension? Does it diminish or increase it? Obviously it makes no difference whether the qualification is positive or negative. 'Unkind mother' enlarges intension just as 'kind mother' does.

§ 313. On the other hand, a negative determination has frequently an adversative suggestion—a mother, yet unkind. And we cannot lay down any law that Intension and Extension are necessarily in an inverse ratio. The addition of one qualification to a concept may very greatly, and the addition of another very slightly, diminish the number of objects included in it. There are twelve times as many white metals as red. Add 'sane' to 'human being' and the number of persons denoted would not be greatly diminished. If we added 'insane'

it would be enormously lessened (Carlyle would deny this of the qualification 'fool'). Conversely, if good poets multiplied among us, this would not affect the idea of good poetry. An increase of population, as Mr. Stock remarks, does not diminish the meaning of 'baby'. All that inverse variation of Intension and Extension means is that, if you 'enlarge your conception' of a term (diminish its Intension) you necessarily allow more objects to come under it, whereas if you narrow your conception (add to the meaning you put upon a name), you necessarily exclude objects from it which otherwise would be included. Observe that an enlarged conception is not one which implies more attributes, but rather one which embraces a larger variety of objects. If guardians of the poor widen their definition of the term 'necessitous' they diminish the qualifications for relief, and make more people eligible to receive it.

§ 314. We are not concerned with the actual empirical extension of a name. Mill truly observes : 'The Extension of a concept is not, like the Comprehension, intrinsic and essential to the concept, and no contemplation or analysis of the concept itself will tell us anything about it. It is an abstract name for the aggregate of objects possessing the attributes included in the concept ; and whether that aggregate is greater or smaller does not depend on any properties of the concept, but on the boundless productive powers of nature.'[1]

§ 315. None the less, be the extension of a concept what it may, it is inevitably increased or lessened by subtraction from, or addition to, the qualities implied in the name. By extension we here mean the actual range of objects to which the name does, or did, or will apply, not those to which it might apply.[2] For

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[1] *On Hamilton*, p. 437.

[2] Sigwart observes that we must 'distinguish between the *logical extension* of the concept and the *empirical extension* of the name. Two-footed unfeathered animal is a different concept from that of Man. They are really different, and, logically considered, they have a different extension' (*Logic*, i. 271). The two classes happen to be the same. Another illustration might be human beings and descendants of Noah. It is an empirical accident that 'of Noah's three sons was the whole earth overspread'. This is not part of the idea of human being, though it might be held that descendant of Adam is inseparable from that idea. But Sigwart's distinction pertains to Realism rather than to Logic. Unfeathered bipeds *might* exist who would not come under the usual definition or idea of Man. But the logician is indifferent to the correctness of definitions.

the possibility of application is unlimited—everything tabular is a table—and it might be urged that one potential infinite is as large as another. The fact, however, remains that the extension of a divided whole is the sum of the extension of its parts ; and that therefore the number of mahogany tables must be fewer than the number of tables. The counter-enlargement of Meaning and Sphere, of Depth and Breadth, means this and nothing more. It does not mean that if there were twice as many sheep the meaning of mutton would be halved ; or that a class containing ten objects has three times as much intension as a class containing thirty. If last week I had six apples, I have not fewer now because they have gone rotten.[1]

§ 316. The address placed on a letter, if we read it (as the post office does) backwards, proceeds by successive limitations, gradually narrowing down the number of possible recipients. Thus :—' Mr. William Robinson, junior, 25 A, Waterloo Square, South Hampstead, London, N.W., England.' The person addressed lives in England, in London, in its north-western district, in Hampstead, in the southern part of it, in one of the squares there, in Waterloo Square, at no. 25, and of the two twenty-fives at 25 A. He is named Robinson, is a male member of that family, bears the name William, and of the two so named is the son, not the father. One person alone possesses all these attributions. ' William, England ' would hardly have found him ; for the wider the possible extension of a term the less adequate is it as a representation.

§ 317. The species dividing a class are either named by prefixing the differentia to the genus—as cart-horse, carriage-horse, racehorse, saddle-horse ; war-ship, merchant-ship, training-ship ; writing-paper, blotting-paper, newspaper—or else by a substantive either suggestive of the differentia—as poet, cook, artist, politician,—or a word which does not suggest the differentiating quality—as ink, coal. Species named by a differentiating prefix are seen at once to have a greater intension than the genus—post office than office, peafowl than fowl—; but, if we were asked which has more

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[1] This, I presume, is what Dr. Bosanquet means when he remarks that ' proper names and numbers mark the same extension as persistent through intensions partially, at any rate, varying '.

meaning, 'tailor' or 'man', 'corporal' or 'soldier', 'bun' or 'food', 'old maid' or 'woman', we might, perhaps, incautiously say the latter name in each case. That is because the differentia of 'man' is so much more important than that which specifies 'tailor' (and similarly in the other cases) that we are apt to forget that the lower concept includes all that the higher concept means, and something more. Roses are not divided into red and non-red *things*, but into red and non-red *roses*.[1]

§ 318. Not every higher concept[2] under which a class may be placed, in other words not every attribute which the class possesses, is part of the ordinary intension of the class-name. 'Extinguished in South America' is not the differentia of 'monarchy' as a form of government, nor 'heavy to hold' of 'folio' as a book. The meaning or definition of a term may shift for me with the momentary interest of my mind; but it cannot be supposed to change with every enlargement of my knowledge—e. g., of rat, if I am told that rats desert sinking ships. Nevertheless enlarged knowledge may cause me to define a name differently; and some acquisition of knowledge is a necessary preliminary to all definition. It should be noticed, then, that until I know what higher concept to place a given concept under, I cannot tell that the latter has a greater intension than the former. It is obvious that a seabird is a bird and something more, but not that a gull is so. Until the judgement is completed, there is nothing to show that the subject has the predicated attribute.

§ 319. Mill objects to the distinction between Extension and Intension that it

'is merely a bad expression for the difference between the two modes of signification of a concrete general name. . . . The Extension is not anything intrinsic to the concept; it is the sum of all the objects in our concrete images of which the concept is included; but the Comprehension is the

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[1] Of course we frequently attribute to a class *generaliter* something which is not true of certain sections of it. Because Englishmen are free it does not follow that Dartmoor convicts are free; nor, because *laborare est orare*, that the treadmill is prayer.

[2] By 'higher' the logician, unlike the physico-realist, does not mean superior in objective dignity, but only superordinate in conception. Being divided into chapters is only a 'higher' notion than that of the Bible as being more abstract. The same with 'never found now on earth' compared with 'perfect holiness', or 'carnivorous' with 'European'.

very concept itself; for the concept means nothing but our mental representation of the sum of the attributes composing it'. Still, the extension depends upon the intension. What is really extrinsical to the concept is, not the number of objects to which the name applies, but the knowledge which we chance to possess about the non-defining attributes belonging to the class. We might associate blue clothes with a policeman, or snuff-taking with a Scotsman, and *conceivably* those names might be defined with 'wearing blue clothes' and 'snuff-taking' as genus or differentia. But a definition is not a list of everything that may be said about a subject (e. g., that cats may look at kings), nor even of the ideas which we always associate with the subject (e. g., that cats mew, lap milk, and so forth), but only of those attributes which seem to us important, either in the nature of things or for some special purpose. And definition necessarily takes the form of a higher concept limited by a differentia, so as to be exactly equivalent in meaning to the *definiendum* and to apply to exactly the same objects, neither more nor fewer.

§ 320. The relation of the higher and wider concept to the lower and narrower is, when considered in extension, that of logical whole to logical part. Metaphysically, Hamilton adds, the relations are reversed. But this is only true between defining and defined concepts, in other words between *genera* and *species*. 'Tradesman' is part of the idea of grocer, 'naval officer' of the idea of admiral, 'animal' of the idea of man. But there is no conceptual involution of 'wearing epaulettes' in admiral, or of 'valuable' in old Sèvres china, though all admirals wear epaulettes and all old Sèvres is valuable.[1]

§ 321. Outside the hierarchy, then, of Natural Kinds and Cogitable Ideas there is an infinite possibility of predication, that is of ranging class under class, in which the ascending and descending series cross and re-cross in every direction. Sigwart[2] observes :—

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[1] Mill's criticism of Hamilton, viz., that two-footedness is comprised among the attributes of man, but is no part of the signification of the name, is therefore correct (*On Hamilton*, p. 434). Yet Aristotle defines man not only as ζῷον λογικὸν θνητόν but as ζῷον πεζὸν δίπουν.

[2] Sigwart elsewhere observes that 'The whole of syllogistic process becomes of doubtful value if, instead of regarding it as a means to the

'There is no order of succession in the subordination necessarily given by the nature of the concepts. There is no settled order of precedence according to which all concepts which have a logical possibility and justification may be arranged in one way. Just because concepts, as we understand them, are subjective creations, formulae whose chief purpose is merely to fix our ideas and mould them into commonly accepted and unambiguous predicates, they are capable of unlimited variation by the many ways in which they can be combined. . . . The idea of an arrangement of concepts such that the more specialized concepts branch off in increasing numbers from one point, the conception of the ὄν or something, is thoroughly vicious. It presupposes that there must be a much smaller number of higher generic concepts than of the more specialized. But if we regard concepts as being combinations of a limited number of characteristics, it depends entirely upon their interrelations whether combinations of greater or less generality are the most numerous. The necessity of any fixed order, and hence this imaginary pyramid of concepts, can be grounded only upon the metaphysical view which regards the higher concept as the real cause of producing the lower.'[1]

§ 322. Realism has a great deal to say for itself, but it is not Logic. It is no objection to it that it is mystical; but only that it is outside our point of view.

construction of concepts by a Socratic ἐπαγωγή, we look upon it in the light of the scholastic logic; if, that is, we accept it as based upon a *finished system of concepts* incapable of further growth, and upon the analytical judgements yielded by such a system. [If the relation of the concepts is presupposed] what do we gain by the process of continuous ascent to higher concepts? If our object is to extend our knowledge by means of judgements, we are moving in the wrong direction. Our predicates become poorer and less significant; we learn less about our subjects, and lose instead of gaining by our progress. If I know that a square is a parallelogram, I know much more than I can learn by erecting a ladder of inferences which end by teaching me that it is spatial or divisible, or that it is a being of some kind' (*Logic*, i. 357, 358). A realist Logic, in other words, only uses analytic judgements, from which we gain our knowledge of the world deductively. Still, much is gained by analysis of notions—if, e. g., examination of the idea of free will gives us the idea of moral responsibility and explains temptation. Sigwart himself says in another place :—' We cannot regard it as an imperfection that predicates, generally speaking, are poorer in determinations than the concrete and fully developed subjects of which they are predicated, and that they are more or less deficient when compared with the intuitable reality of particular things and events' (i. 273). He is speaking of analytic judgements, for he instances fruit compared with pear, clock compared with pendulum clock.   [1] *Logic*, i. 273.

§ 323. The realistic pyramid ends in a point, which is summum genus to all the lower species. And, even apart from a hierarchical arrangement of concepts, since every predicate is a subject, we may follow any series we please, step by step, until at last we come to a predicate beyond which we cannot go. Such diverging predicates are like the extreme twigs of a tree, and are without number. And yet they have this in common that they are all *things*. For every adjective must have a substantival notion to qualify. Aristotle, followed by Porphyry, regarded each of the ten Categories as a summum genus; and the several sciences may be considered as starting from some general conception—geometry, for instance, from the idea of bounded extension or spatial magnitude, architecture from that of building, tailoring from that of dress. But, philosophically, there must be some element common to all nameable things, an absolute Highest, pure Attribution, as yet, in the abstract, unqualified and unspecified, but having potentiality of being determined in every conceivable way and of being predicated of every nameable object, even of opposites, but to which nothing is in the relation of predicate. 'Object of thought' and 'thinkable content', which have been suggested as descriptions of this Highest Predicate, rather evade the question what it is. 'That which—', but what is 'that'? The neuter gender seems best to convey the idea of colourless attribution. The Greeks used the indefinite τι, 'a somewhat,' 'a kind of neutral thingness.'

§ 324. According to Hegel, the ascending scale of generalization culminates in God, the Supreme Notion. This is to make the Deity poorest in attributes instead of richest bare abstract Being rather than pulsing with all life and warmth and colour. It transforms God from a Person to a predicate, which is to be asserted of all existences. This tea-cup, this crime, this public loan, this treachery, is ultimately God. It makes Him to be universal effect and attribute rather than universal cause and substance. God is Truth. But truth without content, abstract nakedness of truth, is meaningless. It is the Divine attributes which are true, being essential.

§ 325. In examining the Import of the Proposition we shall see that in every attribution the determined element in the subject, the unemphasized part, reappears actually or mentally

in the predicate. 'A penny saved is a penny gained.' 'A watched pot (is a pot that) never boils.' And, reduced to its ultimate nucleus, the real subject and the real predicate in every proposition, when all else has been stripped away, is *Reality*. Reality qualified in this way is reality qualified in that way. Gradually diminish the intension and the highest predicate, the most general category of thought, will seem to be '*is real*'. But to be thought as actual and concrete, this highest notion must be specified, qualified, determined. We only know thing-stuff, the *materies rerum*, in its manufactured state.

§ 326. While at one end of thought we have a concept so capacious and devoid of special characteristics that we can find no higher concept under which to place it, a predicate to all subjects, at the other end, in the descending direction, we arrive at classes so narrowed in extension, and so complete in all possible characteristics, that they cannot be differentiated any further, or predicated of any more concrete class, but only of individuals. In the language of physico-realism each of these is an *Infima Species*.

§ 327. Logically there should be an endless number of such lowest species. For the combination of positive attributes with negative ones is theoretically endless. Thus, to carry the specification to the third step only, we get as follows:—

```
                            A
              ┌─────────────┴─────────────┐
              B                          not-B
        ┌─────┴─────┐              ┌──────┴──────┐
        C         not-C            C           not-C
     ┌──┴──┐     ┌──┴──┐        ┌──┴──┐       ┌──┴──┐
     D   not-D   D   not-D      D   not-D     D   not-D
```
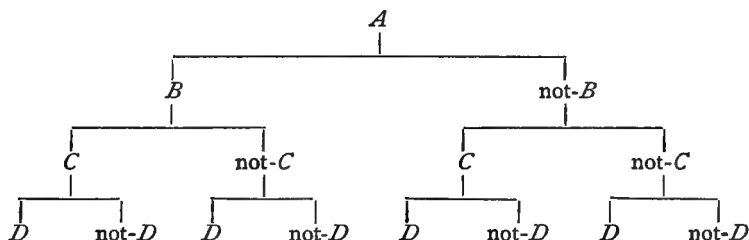
giving eight lowest species, viz. *DCBA*'s, not-*DCBA*'s, *D* not-*CBA*'s, not-*D* not-*CBA*'s, *DC* not-*BA*'s, not-*DC* not-*BA*'s, *D* not-*C* not-*BA*'s, and not-*D* not-*C* not-*BA*'s. Logically, again, there can be no such thing as an absolutely lowest species; for the possible differentiae, applicable or inapplicable, are inexhaustible. But in natural philosophy and in everyday matters we get both the *genus generalissimum* and the *species specialissimae*. In an army highest genus and lowest species are, of course, not commander-in-chief and private, but at the top

'soldier' and at the bottom field marshal, colonel, captain, bombardier, drummer boy, and so forth; or dragoon, lancer, sapper, artilleryman, infantryman, &c. Geometrical figure is divisible as rectilinear and not rectilinear, and the former, according to the number of sides, as trilateral, quadrilateral, &c. Trilateral may be divided as equilateral and not equi·· lateral; and the latter class as isosceles and scalene. These allow no further subdivision in respect of the sides—unless the positive length of the sides, carrying with it an infinite differentiation of the angles, be taken into consideration—so that for the geometer, if not for the logician, these will be infimae species. For military purposes, the classes mentioned above were practically lowest. Linesmen need not be distinguished as blue-eyed and brown-eyed, though it might be necessary to divide them as married and unmarried.

§ 328. We are concerned, however, only with the theoretic limit of specification; and, formally, the most homogeneous individuals can always be further differentiated, even were they new shillings or sands on the seashore. Two identical beings, says Leibnitz, do not exist. No intuitions can be so alike as to be absolutely indiscernible (ἀδιάφορα). There must be at least a distinction of time and space, a *differentia singularis et numerica*. To the *quidditas* can always be added a *haecceitas*. There is no such thing, then, as a principle of individuation distinct from the principle of specification. An individual presentation to consciousness may be pointed to, but cannot be characterized save in general terms.

§ 329. We are always seeking in our thoughts to connect individual objects by some intellectual link. Some people can never remember the order of the balls in croquet, now that stripes have been superseded by colours. If English streets, like houses, were numbered, the effect would be unpicturesque; yet it would be easier to find a known address. πᾶς γὰρ λόγος καὶ πᾶσα ἐπιστήμη τῶν καθόλου καὶ οὐ τῶν ἐσχάτων.

§ 330. The schoolmen gave to Lowest Species in relation to higher genera the name of *species subiicibilis*; but in relation to the individuals of which it is predicable *in quid* they called it *species praedicabilis*.

§ 331. Between the highest predicate and lowest subjects stands the interlacing chain of Subaltern (ὑπάλληλα) Concepts, in

turn subordinate and superordinate, the dividing members of any concept at each stage being the co-ordinates.

Porphyry divides substance thus :—

$$οὐσία$$
$$|$$
$$σῶμα$$
$$|$$
$$ἔμψυχον\ σῶμα$$
$$|$$
$$ζῷον$$
$$|$$
$$λογικὸν\ ζῷον$$
$$|$$
$$ἄνθρωπος$$
$$|$$

Σωκράτης   Πλάτων   Ἀλκιβιάδης   κ.τ.λ.

With Aristotle the concrete individual (τόδε τι) has full substantive reality in itself, while the universal is a mere predicate. But, as I have said, reality runs all through predication as substratum of every assertion, so that every attribute is predicated of reality, and every predicate is affirmed to be real.

§ 332. The relation of a Concept to higher and lower concepts suggests the subject of conceptual Matter and Form. These names are given by Porphyry in his *Eisagoge* to the generic and differentiating elements, respectively, of any Notion. He says that, as a statue has a certain material on which the craftsman impresses this or that form, so out of the raw and as yet undetermined matter of a notion, say 'animal', you, so to speak, shape the species 'man' by means of the mould or form 'rational', and other species of the same genus by other forms.

§ 333. The abstract or general, then, is specified or concretely realized by being differentiated. And the concrete, accordingly, is not matter only, nor form only, but matter and form combined. Matter is the potential, which the actualizing form makes actual—Aristotle's ἐντελέχεια.

§ 334. It follows that what is matter *plus* form in relation to a higher concept is matter in relation to lower ones, that *genus* and *species*, abstract and concrete, are relative, not absolute, expressions, and that the Actual from one standpoint becomes Potential from another. Fruit, which is a particular kind of vegetable growth, is a general concept in respect of apple, peach, mulberry, and pomegranate. Spiritual exercise is the

matter of prayer, and prayer is the matter of public and private prayer, or prayer pre-composed and unpremeditated.

§ 335. In this metaphorical use of the words, Form and Matter do not at all correspond to Incorporeal and Corporeal, or to Mental and Sensuous. In 'fallen spirit' 'fallen' is form and 'spirit' is matter, just as 'suet' is form and 'pudding' is matter in 'suet pudding'. In fact the material element of a concept is, in a sense, more mental than the material and formal elements combined, as being further removed from concrete experience—'mechanism' than 'watch' and 'garment' than 'coat'.

§ 336. The logical πρώτη ὕλη is thus Summum Genus, as yet indeterminate and 'before a rag of form is on'. The logical Form of any concept is that which characterizes and differentiates it, not its whole essence or definition but the essential note by which it is made to be what we conceive it (τὸ τί ἦν εἶναι σημαῖνον), as distinguished from other things of the same class. It is by possessing this note that any individual of the class is seen to come under it and to be entitled to share in the common name. The form, or *differentia substantialis*, is thus a universal. Every member of the generic class which has the mark belongs to the species. The mark becomes a syllogistic middle term.

§ 337. It must be pointed out, however, that this employment of the words Matter and Form for the generic and the differentiating parts of a concept, however convenient, is merely figurative. It does not correspond with the metaphysical use of the expressions. With Aristotle, in whose philosophy Form and Matter are such pregnant conceptions, Matter is the formless and negative substratum of varying determinations, not, however, in a logical and subjective, but in a physical and cosmological, sense. It is the subject of development and of decay.[1] At the other end, God is pure Form and highest Essence, unalloyed with matter and distinct from the world, yet the source of all movement, giving essence to all existences, and so, since all movement is upward from the potential to the actual, a completely realized actuality, absolute, infinite, eternal.

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[1] ἔστι δὲ ὕλη τὸ ὑποκείμενον γενέσεως καὶ φθορᾶς δεκτικόν (*De Gen. et Cor.* i. 4. 320ᵃ2). Aristotle explained by Matter and Form that problem of Becoming which Platonism solved by the doctrine of the Divine Ideas or the world-soul superinducing form upon rude material, orderly shape upon primal chaos.

In the words of Drummond of Hawthornden :—' Eternal things are raised far above this orb of generation and corruption, where the First Matter, like a still flowing and ebbing sea, with diverse waves but the same water, keepeth a restless and never-tiring current.'[1]   While, then, Aristotle regards Matter as τὸ ἀόριστον πρὶν ὁρισθῆναι καὶ μετασχεῖν εἴδους τινός,[2] that elementary constituent which is common to all composite things, generation, the imparting to subject matter of a particular form, is the work of the Creator, or of human art, not the subjective conception and synthesis of your or my mind.   Disease is not the matter of consumption and leprosy, nor skill of seamanship and cookery, nor dignitary of bishop, dean, archdeacon, &c., in the same sense that tallow is the matter of soap and candles or animal nature of oxen and wolves.   Bacon's superinduction of forms upon matter was not a mental process in metaphor, but the practical aim and business of experimental science.

§ 338. We see, however, the ontological usage passing into the logical in the conception of Socrates and Plato as possessing a common *subiecta materia* or essence, viz. humanity, which sustains in the one case the form *Socratitas*, and in the other the form *Platonitas*.[3]   The *genus naturale* here is the same as the *genus logicum*.

§ 339. In what sense, it is now necessary to ask, do we distinguish the formal and material in Reasoning?   Here are Mansel's words :—

'The term *matter* is usually applied to whatever is given to the

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[1]   *The Cypresse Grove.*

[2]   *Metaph.* A. 8. 989^{b}18. Lewes holds that the distinction between Matter and Form, between potential and actual existence, is a merely fictitious distinction imported by a metaphysical fallacy into the objective world.   'As a fact nothing really exists till it exists ; and nothing exists possibly ; for possibility is only the uncertainty of our ignorance' (*Hist. of Phil.* i. 317, 318).   But the distinction is really imported into logic from the objective world.

[3]   Abailard, who speaks thus, nevertheless understands the universal · nature even of human beings in no realist sense.   ' Sicut Socratitas, quae formaliter constituit Socratem, nusquam est extra Socratem, sic illa hominis essentia, quae Socratitatem sustinet in Socrate, nusquam est nisi in Socrate.'   For the as yet undifferentiated nature 'nusquam pure subsistit sicut pure concipitur, et nulla est natura quae indifferenter subsistat' (*De Generibus et Speciebus*).   Carlyle has a phrase about Correggio's corregiosity.

artist, and consequently, as given, does not come within the province of the art itself to supply. The *form* is that which is given in and through the proper operation of the art. In sculpture the *matter* is the marble in its rough state as given to the sculptor ; the *form* is that which the sculptor in the exercise of his art communicates to it. The distinction between matter and form in any mental operation is analogous to this. The former includes all that is given *to*, the latter all that is given *by*, the operation. In the division of notions, for example, the generic notion is that given to be divided ; the addition of the difference in the art of division constitutes the species.'[1]

§ 340. We seem here to be slipping back to the metaphorical idea of matter and form as the generic and the differentiating. Mansel certainly did not hold that we are capable of dividing a notion, that is of differentiating one species from another, by an act of pure thought. But elsewhere he says :—

'The thinking process is *formal* when the matter given is sufficient for the completion of the product, without any other addition than what is communicated in the act of thought itself. It is *material* when the data are insufficient, and the mind has consequently to go out of the thinking act to obtain additional material.'[2]

§ 341. Now in the Kantian system matter is the manifold of the external world presented to our experience ; which, however, is only rendered possible by certain (as Kant calls them) *a priori* conditions. The naked impressions upon our senses, inner and outer, have to be clothed upon and fashioned by the native Forms of the Sensibility, the result being Concepts. Concepts, again, are combined one with another, or presentations with concepts, by the Forms of the Understanding. The mind exercises its synthetic activity upon the materials set before it, moulds them and forms them. 'Kant,' remarks Mill, 'holds that every fundamental attribute which we ascribe to external objects is a Form of Thought, being created, and not simply discerned, by our thinking faculty.'[3] Archbishop Thomson defines Form as 'the mode of viewing objects presented to the mind'.[4]

§ 342. Similarly Hamilton says that the Form of Thought is the product of the operation of thought upon the faculties of

[1] *Prol. Log.* p. 226.   [2] *Aldrich*, p. lxiii.
[3] *On Hamilton*, p. 403.   [4] *Laws of Thought*, p. 33.

experience. Mill, accepting this statement, interprets it thus: 'By the Form of Thought we must understand Thinking itself, the whole work of the Intellect. The Matter of Thought is the perceptions or other presentations in which the intellect has no share; which are supplied to it, independently of any action of its own. What the mind adds to these, or puts into them, is Forms of Thought.'[1]

The Matter of Reasoning, in the same way, is the premisses supplied in outline to the Reason. The Form of Reasoning is the activity of the Reason upon these premisses.

§ 343. This psychological sense of Matter and Form is clearly different from the two other senses already mentioned, either the conceptual determination of a generic notion by some difference, or the creative stamping of shape upon rude world-material. But in all three there is a *datum* and an operation performed upon it.

§ 344. It is still, however, not clear what is meant by *formal thinking*, which cannot be merely the activity of thought in impressing a form upon the material before it. For all thinking is thus formal, or rather is itself a form impressed on matter. Mansel speaks, however, of the mind having sometimes to go outside the thinking act to obtain additional material—which sounds like the cook refusing to make an omelette without more eggs—in which case he says the thinking process is material.

§ 345. A bishop, let us say, can be judged at once to be a responsible ruler, because 'the matter given is sufficient for the product'; in other words, a mental analysis of the idea of a bishop supplies the predicate of the judgement. But if I am given 'bishop' and 'member of the House of Lords', the *data* are insufficient for judgement, and I must go outside them for fresh material.

This fresh material, however, is obviously a middle term.

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[1] *On Hamilton*, p. 462. Mill adds :—'Logic and Thinking are co-extensive. It is the art of Thinking, of all Thinking, and of nothing but Thinking. And since every distinguishable variety of thinking act is called a Form of Thought, the Forms of Thought compose the whole province of Logic; though it would hardly be possible to invent a worse phrase for expressing so simple a fact.' The view taken in the present volume that the 'art de penser' is one thing and Logic quite another is so different from Mill's, that the two views in conflict seem like the scuffling of two blind men.

So that Mansel's 'material thinking' is only another term for syllogizing.

§ 346. We have also seen above (§ 46) that even analytic judgements, like 'A bishop is a ruler', are really mediate, not immediate; and if so there is no such thing as formal thinking as distinct from reasoning. In any case the product is a reasoned product. We have seen too that 'synthetic judgements *a priori*', such as Euclidean propositions, are mediated.

§ 347. For Logic the only formal process, then, in Mansel's explanation of the phrase, which I gladly adopt, is reasoning, which is necessarily formal. It moves along the lines of a skeleton and abstract construction, without paying any attention to the truth of the material supplied to it—and this material is not, except in analytic judgements, the content of the terms but only their relations in thought—or using any other material. Directly it does go outside its *data* the reasoning is by most logicians called material. That is to say, the conclusion is reached on other grounds than the premises warrant. The fact that no bishop is a burglar, and that all burglars belong to the professional criminal class, does not entitle me to conclude that no bishop belongs to the professional criminal class. I can only learn this by knowing something about the character and pursuits of the episcopate; which knowledge is not in the *data*. The conclusion is arrived at by *reasoning*, so far as it is a conclusion. But because the facts which support it were not given, but belonged objectively and extraneously to the matter given, the reasoning is called material. The expression seems somewhat misleading.

§ 348. We have thus distinguished the idea of Reasoning as a formal process from the Form of Reasoning, which is contrasted with the Matter of Reasoning as Form and Matter are contrasted in Conception and in Judgement. There cannot really be such a thing as material reasoning; nor has 'material thinking' any intelligible meaning.

§ 349. It remains to remind the reader that whereas the material supplied to the conceiving and the judging activities must be significant and have content, the Matter of any process of reasoning may have symbols for terms. Yet, viewed as products, the Matter of a concept or of a judgement can be expressed symbolically. We can say that the propositions ' Some X's are

Y', 'Some M's are N', have the same Form but different Matter, just as we can say this of 'Some fiddlers are blind', 'Some oysters are unwholesome.' The judged Quantity and Quality of a proposition are its Form.

§ 350. Again, it is never enough to supply the Ratiocinative activity with terms. Their outlined relations must be given. For it is these relations about which we reason; so that, once they are given, the meaning of the terms may be forgotten, yet we can still argue. Or the meaning may never have been known to us at all. The Matter of Reasoning, then, is the form of judgements. The Form of the reasoning, imposed by the mind, is the inferential type, the conclusion as mediated thus or thus, the argumentative construction (Mood and Figure).

Accordingly the following reasonings are alike in Matter and also in Form :—

<div style="text-align:center">

No Y is Z No M is N

Some X's are Y Some L's are M

∴ Some X's are not Z ∴ Some L's are not N.

</div>

And the following are unlike in Matter and unlike in Form :—

<div style="text-align:center">

Every Y is Z Every Y is Z

Every X is Y Every Y is X

∴ Every X is Z ∴ Some X's are Z.

</div>

Syllogisms which are alike in Matter cannot be unlike in Form. For, whereas a false judgement is a judgement, a wrong conclusion is no conclusion. Similarly, syllogisms unlike in Matter cannot be alike in Form. In fact, Syllogism being essentially formal, its Form is indiscerptible from its Matter. Some, however, regard the conclusion as the Form and the premisses as the Matter : in which case *Baroco* and *Festino* (ex. gr.) are unlike in Matter but alike in Form.

§ 351. The usual view makes the Matter of a syllogism as of a judgement to be the content of the terms : in which sense we say that reasoning is not affected by the subject matter reasoned of. We could not say that a conclusion is not determined by its premisses. But this is to abandon the view of the Matter of an operation as the *data* supplied to it (see above, § 339). The whole subject is full of ambiguity.

We must now return to the subject of the relation of a Concept to lower and higher concepts.

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CHAPTER XI

DIVISION AND DEFINITION

§ 352. WHAT result does the application of pure Reason to the Division of the Concept afford ?

Hamilton observes :—' When we determine any notion by adding on a subordinate concept we divide it ; for the extension of the higher concept is precisely equal to the extension of the added concept *plus* its negation.' [1]   And Sigwart says :—' Upon the fact that characteristics which are incompatible among themselves may yet be compatible with another, is based the differentiation of concepts, and their complete development by Division.' [2]

§ 353. The limiting of one notion by another (e. g. *horse* by *black*) implies that of the remaining extension of the former concept (those horses which are not black) the limiting characteristic must be denied.   If some A's only are conceived as B, the other A's are conceived as not B.

This is Division by Dichotomy, which exhibits the extension of a concept in accordance with the principle of Excluded Middle. It aims at *distinctness*, at the explication of the internal constituents or classes which together make up the extension of the common name.

§ 354. Pure reason will further tell us that any ground of division may be taken.   Backgammon-boards either are or are not ballet-dancers.   Alligators either do or do not play the pianoforte.   Thoughts equally with mushrooms are divisible into edible and non-edible kinds.   Suppose that all are on the negative side of the division, that is no concern of the logician's.   No doubt the doctrine of the Excluded Middle exposes him to more derision than any other part of Logic.   But substitute letters of the alphabet (not disclosing their content) for concepts, and the doctrine is unchallengeable.   See above, §§ 150 seq.

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[1] *Lectures on Logic*, i. 194.
[2] *Logic*, i. 280.

§ 355. For Division to be of any use, however, some principle of division must be given extraneously. Books, suppose, are to be divided according to size. Then we must be given a particular size, say folio. To divide non-folio we must be given, say quarto ; and so on. No doubt, if an idea be supplied, such as the number of times a sheet is folded, and also an arithmetical progression, we can go on, quarto, octavo, duodecimo, &c. If the idea be an absurd one—e. g. to divide virtues by the number of their feet—the absurdity will not be lessened by carrying on the successive stages in an orderly method—one-footed, biped, three-footed, quadruped, &c., centipede, &c., millipede, &c., virtues.

§ 356. Yet whatever basis of division has been chosen must be adhered to, if the differentia only of each member of the division (i. e. of the cognate species) is to be stated. The cognate *genera* are read upwards—as, non-octavo non-quarto non-folio book. They fall under one another, whereas cognate *species* are co-ordinate. Thus the following division—

(I)
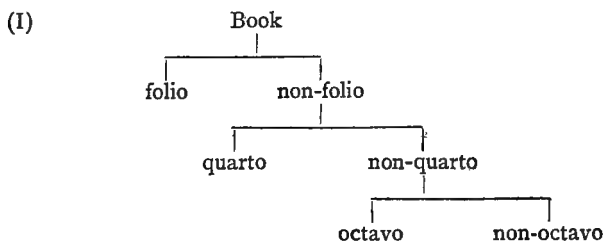
can be read off thus—Books are divided into folio, quarto, octavo and non-octavo books. But if we divide thus :—

(II)
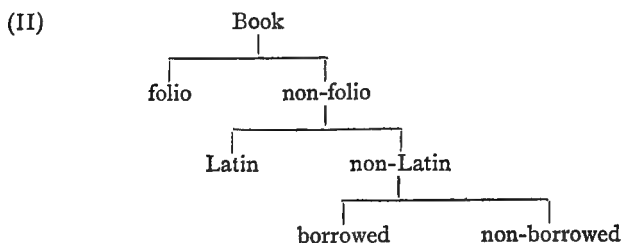
then to say that we have divided books as folio, Latin, borrowed and non-borrowed would be a cross-division. Having a part at least of their extensions in common, the dividing concepts over-lap. The real result of the division is into folio, Latin non-folio,

borrowed non-Latin non-folio and non-borrowed non-Latin non-folio books—which is rather confusing, but perfectly rational. In any case the last class of a division must always be negative ; for theoretically a division cannot specify all the dividing members.   We cannot tell but what there are ' other varieties '.

§ 357. If a new *fundamentum divisionis* is introduced on the negative side it may also be introduced on the positive side.   The Scottish ' Secession Church ' was divided in 1747 into burghers and anti-burghers, and either of these sections was divided later into new lights and old lights.   Of course, if the positive side is subdivided, the basis of division must necessarily be changed on that side.

§ 358. The following carries us three stages :—

(III)

Book
|
folio — non-folio

folio:
Latin — non-Latin
Latin: borrowed non-borrowed
non-Latin: borrowed non-borrowed

non-folio:
Latin — non-Latin
Latin: borrowed non-borrowed
non-Latin: borrowed non-borrowed
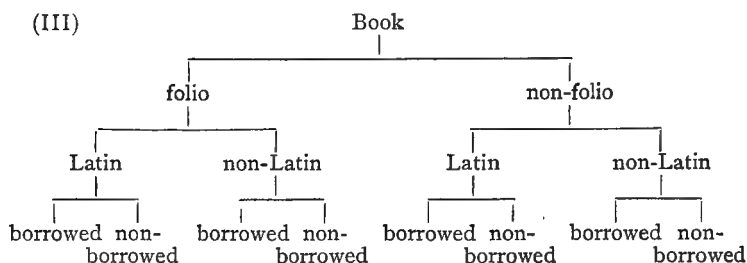
But the negative side at each stage might have continued with an unchanged basis of division.   Thus :—

(IV)

A
|
B — non-B

B: C — non-C
C: D non-D
non-C: C' non-C'

non-B: B' — non-B'
B': C non-C
non-B': B'' non-B''
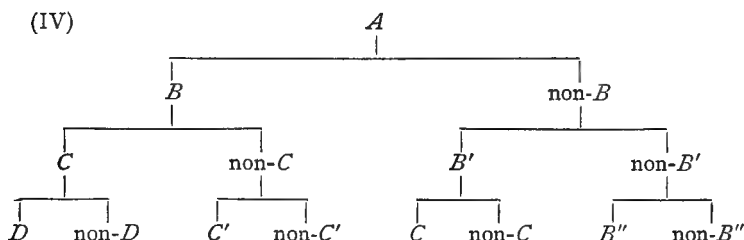
Such a scheme is pyramidal in shape because the higher extension ramifies into the lower ones, just as the roots of a tree, if combined, equal the trunk in thickness.

§ 359. The division of a class, then, into its constituent species can only be effected logically by successive dichotomies.   The rule that the dividing members shall together make up the *totum divisum* is thus secured, the last member being, as I have said,

always negative. That they shall not more than make it up, that is, that their extensions shall be mutually exclusive, can be secured by pure reason if the result of the division is read off as (II) above ; but if as (I), we need the aid of experience to assure us that the basis of division is scientifically adhered to.

§ 360. The practical rule that the differentia of any one member shall not be an inseparable accident of the class divided is intended to secure that the individuals shall not be all found in one class. This would be the case if firemen were divided as wearing helmets, wearing turbans, wearing silk hats, and wearing straw hats, or birds as feathered and not feathered. Division implies particular judgements ; but *all* birds are feathered. Empirical knowledge is required also to secure conformity to the rule, ' divisio non faciat saltum.' The distinction between dividing a genus by its species (animal is either man or brute) and dividing it by its differentiae (animal is either rational or nonrational) is superficial, or, at least, extra-logical.

§ 361. False dichotomies are often humorous—as of mankind into tailors and tailored. Byron says :—

> Society is now one polished horde
> Formed of two mighty tribes, the bores and bored.

Pope whimsically classified the population as men, women, and Herveys.

§ 362. When the overlapping of the dividing extensions is unimportant, a cross-division may be sometimes allowed ; as if authors be divided into poets, novelists, historians, divines, critics, and so forth. The possible doubling of parts is accidental. A novelist is not an historian *qua* novelist. On the other hand to insert ' dramatist ' would involve Shakespeare being either not a dramatist or not a poet.

What, in fact, we really were doing was the dividing not of authors but of authorship into its kinds. All flesh, again, is not the same flesh, being divided into flesh of men, of beasts, of fishes and of birds, even though *mulier formosa superne* sometimes *desinit in piscem* and rational beings are feathered in Cloudcuckooland.

§ 363. It is only when an attribute, or abstract idea, has varieties, shades and differences—as there are different kinds of colour, of folly, of illness, of happiness, of consciousness, of iniquity—that it may be regarded as a general concept and

admits of division. A stroke of illness may be called by a figure of speech an illness, but we cannot call an act of madness an insanity. As a rule, only common names, names which have extension, are divisible, thus excluding individual designations and singular abstract names. Yet proper names also may acquire a more or less general character, even while strictly confined to one individual object. We speak of Elizabethan England and modern England, of the old Hector and the new. On the other hand to speak (topographically) of old and new Edinburgh, or of upper and lower Bristol, is a material partition. The case of proper names used by metonymy as common names—e. g. ' a spiritual Quixote,' a ' Napoléon de café chantant '—need not be again referred to, nor yet the case of proper names transferred to classes of objects ; as, a Holbein, a Wellington, a maréchal Niel, a jersey, a St. Bernard.

§ 364. The division of authorship, however, or of any other abstraction, into its kinds must be carefully distinguished from Ideal, or, as Hamilton calls it, Metaphysical, Partition,[1] the analysis of an idea into its intensive elements. E. g. the idea of progression may be broken up into that of movement and that of forwardness. In this kind of division, the divided whole is not predicable of, nor the name of the analysed idea applicable to, each of the separate parts. Again, generous people may be classed as tall and short (or not tall). But generosity is not divisible into tallness and shortness, nor into tall generosity and

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[1] But metaphysical partition is rather the resolution of a substance into its attributes.

' As there are *two kinds of wholes* there are also two kinds of *division*. There is a whole composed of parts really distinct, called in Latin *totum*, and whose parts are called *integral parts*. The division of this whole is called properly *partition*, as when we divide a house into its apartments, a town into its wards, a kingdom or state into its provinces, man into body and soul, the body into its members. The sole rule of this division is to make the enumeration of particulars very exact, and that there be nothing wanting to them.

' The other whole is called in Latin *omne*, and its parts *subjected* or *inferior parts*, inasmuch as the whole is a *common term*, and its parts are the terms comprising its extension. The word *animal* is a whole of this nature, of which the inferiors, as *man* and *beast*, which are comprehended under its extension, are subjected parts. This division obtains properly the name of *Division*' (*Port Royal Logic*, Pt. II, cap. 15).

short generosity. Charitable persons are wise and unwise; and certainly we can speak of wise and unwise charity. But this is because the charitable are necessarily wisely and unwisely charitable.

Concrete classes may often be represented by corresponding abstractions[1]; as when we say that society is made up of youth and age, of discretion and folly, of wealth and poverty. Punctuality is a form of politeness, and is therefore no part of the idea. Again, we divide friends as constant and inconstant, and we say that constancy is a part of friendship. But we cannot say this of inconstancy. Yet we speak of constant and inconstant friendship.

§ 365. Every differentia is a limitation—'black bread,' 'occasional intemperance.' But it is the sphere, not the intension, of the generic concept which the addition of the difference limits. Those who are both tall and generous are fewer than the generous simply. But their generosity is not limited and qualified by their inches.

§ 366. Sigwart observes :—' The prevailing logical terminology is inconvenient, in that it employs the same expressions to denote two processes so different as the analysis of a concept into its characteristics and the development of opposed concepts from one higher concept; these expressions being derived from the act of dividing, and signifying sometimes the division of the content into its elements, at others the division of its extension into mutually exclusive extensions. To this is due the paradox that by dividing a concept we do not get parts of the concept, but concepts which each contain the whole divided concept as a part. If we keep consistently to the content of the concept, we are concerned with nothing but a development of the characteristics contained in it. The term *Division* (Aristo-

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[1] How entirely the use of abstractions as common names is a matter of usage may be seen by observing that we speak of truths and of depths but not of warmths; of highnesses but not of lownesses; of littlenesses but not of greatnesses; of delicacies but not of episcopacies; of loyalties but not of fidelities; of spiritualities but not of animalities; of colours and dolours but not of valours; of vanities but not of sanities; of operations, stations, and the like, but not of emaciations; of sentences but not of penitences; of kingdoms but not (usually) of wisdoms; of universities but not of scarcities. The vulgar expression 'royalties', for royal personages, has lately come into vogue.

telian διαίρεσις) is more applicable to the sum of the particular objects which fall under the concept. This sum is regarded as a whole to be broken up into different groups.' [1]

§ 367. Ideal Partition, indeed, is analogous to Material Partition, the mental separation of an *object* into its component parts; as when we divide a ship into hull, masts, sails, and so forth; [2] or a collective term, as parliament into lords spiritual, lords temporal and commons, college into head, fellows, scholars and commoners. Logical Division is the enumeration of the different classes of objects which together make up a whole class and share in its common name. A concept is *divided* on its extensive, *analysed* on its intensive, side. Although I have more than once used the words *notion* and *concept* as identical, notion is rather conception than concept, and it might be better to reserve it for concept in its intensive aspect. 'Soldier' as a concept is either conscript or recruit; but we should not say, 'My notion (or my conception) of a soldier is either conscript or recruit,' nor yet 'My notion of butter is either salt or fresh'.

§ 368. We have seen that logical analysis of the Form of Thought can tell us what Division of a Concept means, and that pure Reason shows the dividing process to be really a succession of dichotomies. Logic thus supplies negative safeguards against confusion and accidental omission. But it can do no more. Rules for dividing which shall be of positive utility are extra-logical. Thus Hamilton, quoting Esser, says :—

'Those characters of an object are best adapted for a division whose own determinations exert the greatest influence on the determinations of other characters, and consequently on those of the notion itself; but such are manifestly not the external and contingent, but the internal and essential characters; and, of these, those have the pre-eminence through whose deter-

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[1] *Logic*, i. 280 n.

[2] This is sometimes called Physical Partition, an expression which had better be reserved for actual anatomy and severance—such a dismemberment as that of Hood's hero—'There he left his second leg, and the Forty-Second Foot.' The Partition in the text is not the less (logically) 'Material' that it may apply to immaterial objects. Thus Cicero gives a sixfold partition of a speech—exordium, narratio, partitio (or divisio), confirmatio, reprehensio (or confutatio), conclusio (or peroratio).

mination the greater number of others are determined, or, what is the same thing, from which, as fundamental and original attributes, the greater number of others are derived.'[1]

A charity for widows will classify applicants according to age, character, means of support, number of children, and the like; not according as they are fond of animals, tall, musical, or anything of the kind. But what help can the logician give in such classification?

§ 369. Dichotomous division is criticized by Aristotle on various grounds. He exaggerates the importance assigned to it by Plato,[2] who rather awkwardly tried to construct definitions by combining the highest genus with the successive differentiae on which the division has proceeded, but who never intended dichotomy as a substitute for syllogism. Aristotle recurs often to the subject. His objections to Dichotomy are :—

(i) That by subdividing the negative arm we erect negation into a positive principle, and make species often non-existent. But if men are divided into those who are happy and those who are not happy, the latter class are not necessarily more non-existent than the former. Inkpots which are not happy are, in fact, the only existing ones, and it is the positive arm, the happy inkpots, which are non-existent. It will be remembered that only in certain 'universes of discourse' will 'which are not happy' be equivalent to 'which are unhappy'. Again, animals either are rational or are not rational, which in this sphere means, are irrational, and 'irrational animal' is identical with brute, which is a quite positive concept. Had we divided brutes into rational and irrational, it is the rational brutes which have no existence.

(ii) That we cannot by dichotomy demonstrate—as Aristotle seems to have supposed that Plato thought we could do—the essential nature of a thing. For this is indemonstrable, and must be arrived at either inductively or from the authority of the wise.

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[1] *Lectures on Logic*, ii. 31, 32.

[2] See especially *Phaedrus*, p. 265 *a*, 266 *c*; *Politicus*, p. 285 *a, b*; *Sophistes*, p. 253 *a, e*. Aristotle rightly says, οὐκ ἔστι δὲ διαφορὰ στερήσεως ἢ στέρησις (*De Part. An.* i. 3, § 1; cf. *Prior. Anal.* i. 31; *Post. Anal.* ii. 5, § 3). But what is negative in form is often positive in fact.

(iii) That dichotomy is only ἀσθενὴς συλλογισμός. If we wish to prove that man is mortal, and begin by dividing animals into mortal and not mortal, we frame our syllogism thus :—

Every animal is mortal or not mortal. Every man is an animal. Therefore every man is mortal or not mortal. Now, to go on to say, 'Every man is mortal,' assumes the conclusion instead of proving it. Such a syllogism, then, based on dichotomy, leads to nothing.

The answer seems in the present day obvious, that no one can ever have thought it did. And objection (ii) is equally an *ignoratio elenchi*.

§ 370. Proceeding with the analysis of conceptual relations, we see that Division, by which the external connexion of classes with one another is made explicit and their system is deduced, has for its counterpart and converse Definition, whereby the internal content of the idea is made explicit. It is the analytical judgement in its complete form. Yet what is external from one point of view is internal in another. Division internally breaks up a class into its particular sub-classes. Definition declares the external relation of a class to two larger classes.

§ 371. In dividing we differentiate the several members or species of the divided whole, which as a notion is predicable of each of them. In defining we predicate the generic notion of some one of the members, stating at the same time what it is that differentiates it from the other members.

§ 372. As Division is a detailed enumeration of the different species, considered as classes, which are together co-extensive with the genus, so Definition fixes precisely the intension of any species, considered notionally, by identifying it with that of the generic notion differenced in a particular way.

What is divided is a predicate, what is defined is a subject. We say, Divide triangle, wealthy, friendly ; but, Define a triangle, wealth, friendliness. More strictly, it is classes that are divided, names or attributes that are defined.[1]

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[1] Against the doctrine that what is defined may always be regarded as an attribute, the usual definition of triangle as a three-sided figure might be objected. For triangularity is not trilaterality. The geometer, however, is not intending to define *triangularity*, but only ' the being a triangle ',

§ 373. By dividing we are able to answer the question, *Of what kind?* Yonder ship must be classified, specified, as either battleship, or cruiser, or troop-ship, or liner, &c. We define in order to answer the question, *Who, how many?* This charity is left for the indigent? But who are the indigent? How many persons ought to have it? Indigence, therefore, must be defined, the essential qualifications for being considered indigent must be determined, the limits (*fines*), that is to say, within which the name is applicable. It is not necessary, then, to enumerate all the ideas which the word 'indigence' conveys to my mind. All we want is the *quid* and the *quale*, definition being *in quale quid.*

§ 374. Now, if 'Ship' be divided thus :—

Ship

| battleship | cruiser | troop-ship | liner | schooner | &c. |
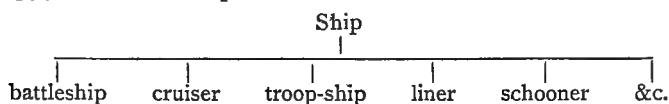
we notice that the species battleship and troop-ship are named by prefixing the differentia to the genus *ship*; cruiser is named from the differentia only; liner the same, but not so clearly; while schooner suggests to ordinary landsmen neither genus nor difference. Sometimes a genus will give its name as suffix to that of all the species composing it; as *tree* may be divided as yew-tree, beech-tree, oak-tree, rose-tree, apple-tree, &c. And yet we also speak of yews, beeches, oaks, elms, chestnuts, and the like. So we say, puppy-dog, bull-dog, sporting-dog, sheep-dog, wire-haired dog (of course this is not a division), but also we enumerate dogs as terriers, retrievers, spaniels, bloodhounds, greyhounds, Newfoundlands, collies, and so forth. Again, boats may be classed as two-oared, four-oared, six-oared, eight-oared, &c., boats, but also as canoe, dinghey, pinnace, gig, skiff, &c.

§ 375. Now, it is plain that whereas, say, battleship, troop-ship, sheep-dog, pear-tree or lifeboat are for ordinary purposes sufficiently defined already, and cruiser, retriever, terrier are sufficiently differenced by their names, and only want their genus to be indicated, yew-tree, elm-tree, oak-tree, on the other hand, tell most of us nothing by their names except that generically they are trees; and yew, elm, oak, beech, not that

which is defined as the being a figure with three sides. 'Triangle' is used with momentary neglect of its verbal significance.

either. So again, red rose for practical purposes entirely defines itself, briar-rose half defines itself, Malmaison does not define itself at all.

§ 376. It is not always possible, then, from the result of a divisive process to reconstitute the definition of any one of the dividing members or species by joining its differentia to the genus; for sometimes, as we have seen, a species has no other name than the genus qualified by the difference; sometimes it is named from the difference only, or suggests it (e. g. quarto = divided in four); sometimes it is named quite apart from either genus or difference, and has a designation to itself. It is only when a word is the *equivalent* of a complex name made up of genus and differentia that, ordinarily, it has to be, and can be easily, defined. Needlewoman explains itself, but sempstress not so well; forenoon, but not morning; midday, but not noon; plough-man, but not hind; foot-soldiers, but not infantry; mean abode, but not hovel; female bird, but not hen. 'Hen', however, is sometimes a substantive name, but at other times a differentiation (hen-bird). 'Ironclad' needs further defining, for by usage a man in armour is not so described, but only ships.

§ 377. As purely abstract ideas (e. g. incorrigibility, change-ableness) are indivisible, so individuals are, properly speaking, undefinable. We cannot define Napoleon, though he has been *described* as a hero who was not quite a gentleman, the Corsican upstart, or the little Corporal. Dr. Parr was 'the Whig Johnson'. If it be objected that such phrases about individuals are sometimes a kind of definition (e. g. Σωκράτης ἐστιν ὁ Σω-φρονίσκου), it must be replied that the really individual is un-nameable as well as undefinable. This or that person or thing is never a single unrelated presentation to the senses, a momentary impression at once forgotten. We cannot get at a purely concrete Napoleon. It should be noticed that many individual designations are complex and descriptive; e. g. Pio Nono, the present King, the House that Jack built, the Giant-killer, the Marquis of Granby, St. Paul's Cathedral. But if it is possible to find a purely non-connotative name, that name is undefinable.

§ 378. Only so far as names imply generality — common names and the connoted attributes—are they definable. But *summa genera* cannot be defined, since they can be placed under no higher class; nor yet simple notions, such as ele-

mentary sensations, for the differentia cannot be indicated. We say, 'I have an undefinable feeling.' The plain man cannot even say that he experiences an affection of the olfactory nerve, or of the palate, nor define the tint of a ribbon by the number of light vibrations which affect his retina. An idea of scarlet, perhaps, might be conveyed by saying that it is a hot colour. But the blind person thought it must be something like a trumpet blowing.

Hamilton says : 'It is manifest that if a concept be simple, that is if it contain in it only a single attribute, it must be undefinable.'[1] No concept is really simple ; yet we may be unable to name the generic, or the characteristic, quality. 'Quand on me demande ce que c'est Dieu, je l'ignore ; quand on ne me le demande pas, je le sais très-bien.'[2] God has been defined by negative differences :—'Thou art great without quantity, good without quality, infinite without number, beautiful without figure, eternal without time, immeasurable without space, pervading without extension, perfect without multiplicity, most exalted without position.' In fact, theological definitions aim less at exposition of the reality and attributes of what is defined than at the exclusion of error by terms which are clear, though it is impossible to develop their full connotation. Some of the definitions in geometry have a negative differentia. A line is length without breadth. Parallels are lines which are in the same plane but can never meet. A point is position without magnitude (θέσις ἀνεὺ μεγέθους).

§ 379. The objection to defining by negation is that the negative characteristic is usually so wide as to be practically useless for the purpose. An East-end child defined grass as 'what one mayn't go upon'. Frequently such definitions are intended epigrammatically. Positivism has been defined as Catholicism without Christianity. 'Baronet' was defined by an amusing member of that honourable order as a person who is not a nobleman and has ceased to be a gentleman. (Here genus as well as difference is negative.) Yet a Gentile would be defined as a man of non-Hebrew race, a 'blackleg' as a non-Unionist workman. 'L'amitié' is 'l'amour sans ailes'.

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[1] *Lectures on Logic,* i. 151.

[2] 'Quid est ergo tempus ? Si nemo ex me quaerat, scio ; si quaerenti explicare velim, nescio' (St. Aug. *Conf.* xi. 14).

§ 380. Good definition is by proximate genus and ultimate difference. It selects as genus a concept slightly more extended than the *definiendum*, but of which the intension is less by as little as possible than that of the *definiendum*. Who would define a lord mayor as a European who lives officially at the London Mansion House, or china as a clay object which the housemaid breaks ? Nevertheless, if subject and predicate are given as interchangeable ideas, pure reason is unable to disallow such definitions, which, moreover, for certain purposes may have their uses. Every one knows the definition of a ship as a prison with a chance of drowning, or of patriotism as the last refuge of a scoundrel, or of a lexicographer as a 'harmless drudge who busies himself', &c. The Irishman's definition of a gun as 'a hole with something round it' obviously needs further determination ; but the child who defined a prodigal as 'one who comes home' had a clear picture in its mind.

§ 381. When the genus seems more important than the differentia, definition will sometimes take a tentative form. 'Revenge is *a kind of* (τις) wild justice.' An accountant is 'something in the City'. In defining we look to what appears to be, for our immediate purpose, some striking feature. We try to define everything by something better known. A fox would not be defined in the same way by a huntsman and by a naturalist. Death, which to the physician is the cessation of all vital functions, is to the singer of Hawthornden 'the thaw of all those vanities which the frost of life holdeth together'. Truth for the metaphysician is the agreement of *idea* with *ideatum*; but St. Cadoc the Wise calls it the eldest daughter of God. The brain is to the poet the seat of fancy and the throne of thought; to the surgeon it is a soft substance of whitish and reddish grey, &c. Every definition, whatever its syntax, is logically *per genus et differentiam*, e. g. the definition of 'amphibious' as 'living on land and also in the water', or that of 'innocent' as 'naked and not ashamed'. Innocence is unashamed nakedness.

§ 382. The rule against defining *per ignotus* is, indeed, merely relative. The unphilosophic mind learns nothing from the definition of Art as 'a productive habit acting in accordance with reason'; or from that of Motion as 'actus entis in potentia quatenus in potentia', or as the identity of Space and Time in

Place; or from that of Time as the measure of motion; or from that of Morality as the astronomy of the heart—Bacon's 'georgics of the mind'—; or from Hobbes's definition of Freedom as 'political power divided into small fragments'; or from Bruno's definition of God as 'monadum monas, nempe entium entitas'. But to the philosopher the notions have really been elucidated. The scientific definition of life as the dynamical condition of an organism would not be that of the plain man. The plain man thinks he knows what ivy is, and is not much wiser for being told that it is an epiphytic plant of the genus *hedera*. But he too may learn something from the definition of sickness as nature's protest against the misdirection of her forces, or from St. Austin's phrase, ' virtus est ordo amoris ' —the orderly and progressive unfolding of love. Johnson's masculine grasp is hardly shown, however, in the definition of network as ' anything reticulated or decussated at equal distances with interstices between the intersections '. Mr. St. George Stock gives as an example of a seemingly far-fetched definition the definition of a triangle as that section of a cone which is formed by a plane passing through the vertex perpendicularly to the base.[1] But this, as he remarks, is correct from the view of conic sections.

§ 383. The last example but one is a bad specimen of the *circulus in definiendo*, or *diallelon*; for what is reticulation and the rest but network? This kind of see-saw definition may be circuitous or the direct substitution of a synonym. The shape of the earth is a geoid. A laundress is a washerwoman. Nostalgia is home-sickness. An archer is a bowman. St. Nicholas's clerks are thieves. One expression happens to be better understood than the other, or nearer the vernacular; but, if this is to define, then a bilingual dictionary is all definitions.

§ 384. And yet, on the other hand, it is not for pure logic to object to definition by synonym or even to circular definition. All that the logician, analysing the Form of Thought, can demand is that the definition shall profess to make explicit the intension (for the particular purpose in hand) of a name— otherwise it is only a description—and that the predicate shall

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[1] *Logic*, i. 117.

be convertible with the subject. No doubt this must be done by delimiting the sphere occupied by the *definiendum* in a higher concept. But the shortest synonym, though its whole sphere is identical with that of the name to be defined, really does this,—for a washerwoman is a woman who washes; a thief is a man who thieves—, and so does the longest and most rambling description—e. g. 'A kitten is a dear little soft playful creature which runs after balls of wool instead of mice, and looks very pretty with a coloured ribbon round its neck'; and so forth. Such filling in of a picture appeals to the fancy rather than to thought; yet it can stand as an unscientific, untidy definition, with 'creature' as genus and the rest as differentia. Aristotle speaks of διαφοραί in the plural, meaning successive differentiations till the concept is reached. Description appeals to the imagination, definition to the mind. You describe an object, define a notion. But the above may be a little child's notion of a kitten. It is not for the logician to say. Prynne's quite serious definition of heaven was 'a place in which there are no stage-plays' (Index to *Histriomastix*).

§ 385. Further, it should be noticed that the distinction between a definition *per genus et differentiam* and other general propositions does not usually appear on the surface. How are we to distinguish 'A man is a rational animal' from 'A boy is a queer creature'? Which of the following are definitions ?—

Despotism is anarchy speaking with one voice (Patmore).

A horse is a vain thing to save a man.

A little learning is a dangerous thing.

Anima est forma substantialis hominis (Aquinas).

A book is a pleasant companion.

A triangle is a three-sided figure.

Hypocrisy is the homage vice pays to virtue.

Brevity is the soul of wit.

A pony is a four-legged animal.

The sacrifice of God is a troubled spirit.

Lux est umbra Dei.

The logician does not know which of these propositions have the *diagnostic* character of definition. He does not know which intended definitions satisfy the rule that a definition must give the fewest attributes that will suffice for demarcation of the

definiendum from other things. 'A square is a figure that has equal sides and four equal angles' gives just enough attributes. 'An equilateral triangle is one that has equal sides and three equal angles' gives too many. 'A square is a figure having four right angles' gives too few. So does 'a draper is a tradesman' (man who trades). 'Retail tradesman' would not be sufficient delimitation either. 'Industrious tradesman' would contract the sphere too much. 'Ratepaying tradesman' would leave it just where it was. But all this knowledge must be given by experience.

§ 386. The view taken hitherto has been that names have no absolute, but only a relative, definition and meaning. A term may be defined differently by different persons, or differently by the same person according to the purpose in view. See above, § 305. Accordingly, the predicate of any general proposition (e. g. 'New brooms sweep clean') may be logically regarded— apart from what is said below, § 421—as standing to the subject in a generic relation, which might become a definition by the addition of a differentia. On the other hand 'Hansom cabs are the gondolas of London' and similar propositions are not properly definitions (though in form they might be so), because they do not profess to give the sense in which a name is, or shall be, used.

§ 387. The distinction then drawn between the 'subjective intension' of a term and its 'meaning or logical significance'[1] is unsubstantial. In contrast, says Mr. Wolf, with the 'empirical idea', which is variable, 'each term has but one meaning, which is the same for all and on all occasions. Its meaning or logical signification is relatively independent of any particular thinker or occasion.' It may therefore be described as 'the relatively objective idea'.[2]

§ 388. Of course language would be worthless as a means of intercourse if there were no general agreement or convention as

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[1] *Studies in Logic* (Cambridge University Press, 1905), pp. 5-14. Sigwart gives 'the warm zone is that which lies between the tropics' as a definition (*Logic*, i. 292). Lying between the tropics is certainly not what the words 'warm zone', as words, necessarily convey. But a shipmaster, ordered by the owner to keep clear of the warm zone, might well ask how he defined warm zone, and be answered with no reference to temperature but only to latitude.

[2] Ibid. p. 7.

to the sense in which words are to be used; and a definition is usually propounded for the acceptance of another or of all. Regard, also, must be had to etymology, though the Port Royalists [1] seem to hold that 'parallelogram' might be arbitrarily defined as a triangular figure, if used exclusively in that sense— an ultra-Nominalist position. The definition is intended to express what seems to the definer the essential nature of the object. He does not select trivial and haphazard characteristics. A good definition enables us to penetrate into the heart of the thing—as when Bolingbroke defined history as philosophy teaching by examples. Lord Russell defined 'proverb' wittily as the wisdom of many and the wit of one. Conscience according to the British sage is the eye of God in the soul of man.

§ 389. But such examples show the impossibility of a distinction between the 'subjective intension' of a term and that meaning which is 'the same for all'. The writer quoted above himself remarks that 'convention is of a more or less relative character'. At any rate the distinction is one of which Logic can take no cognizance.

If meaning is objective, we come to Lotze's 'eternally self-identical significance of ideas which always are what they are' [2] —the Platonic Ideas, in fact, and Realism. The logician has no quarrel with Realism. But Realism is not Logic. And an 'absolute meaning' seems to be a contradiction in terms.

§ 390. Definition cannot be of the nature of the thing, but only of the content of the notion.[3] If it were of the former,

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[1] *Logic*, Pt. I, c. vii. Mansel, however, remarks that 'the etymology will in nine cases out of ten declare, not the present meaning of the word, but either one that has become obsolete or some secondary notion which may account for the imposition of the name, but which at no time formed, strictly speaking, any part of its signification' (*Aldrich*, p. 186). 'Priest' means the same thing as 'alderman'; yet since it was taken over by the Christian Church from the Synagogue it probably never connoted age in any way. 'Bishop', on the other hand, has not lost its meaning of overseer. 'Gentlewoman' and 'nobleman' keep their etymological signification; but 'gentleman' only does so in part. And no one would define 'chivalry' with any reference to riding on horseback.

[2] *Logic*, § 317.

[3] Nevertheless, names are the names not of ideas but of things. The former view, as Bain notices (*Logic*, Pt. I, p. 46), 'is a species of idealism, confounding together the object and the subject.'

definitio rei, it would not be *per genus et differentiam,* but a catalogue of attributes. That is, it would not be a definition. Definition, in other words, is necessarily conceptual. And, moreover, what does 'the nature of a thing' mean, apart from some eternal exemplar in the Divine mind? Physico-realists endeavour to give some objective and absolute significance to the word 'essential' by speaking of the necessary constitution of certain natural kinds, possessing a permanent ground, a self-centred unity, which is the basis of all minor attributes and unfolds itself in varying manifestations and activities. And certainly a permanent definition, propounded with no special object in view, will try to express this permanent nature as nearly as possible. But, none the less, definition is always the analysis of a concept, and a concept is what the mind has conceived. Define *Liberty.* What do you understand by it? In what precise sense do you, or others, use the word? What, in your view, or in the generally accepted view, are the essential notes of the *Church*? How do you know it when you see it? Hamilton's distinction between the essential and accidental qualities of a thing, that the former are those ' which it cannot lose without ceasing to be '—a 'vulgar' explanation, according to Mill, marking 'a retrogression from Conceptualism to Realism '[1]—ought to run, ' which it cannot lose without ceasing, *in the view of the speaker,* to be.'

§ 391. All giants are tall and all are supposed to be feeble-minded. It may seem obvious that tall stature is an essential attribute, and feebleness of intellect only an accidental one. But this is to make essence depend on definition, not vice versa. Every very tall being is conceived by my mind under the concept giant. Tallness *constitutes* a giant, but does not *make* any one a giant in the sense that it makes him able to see over people's heads. It is the formal, not efficient, cause. From another point of view it might be considered essential to a giant to have a sufficient supply of babies to eat; non-essential that he should carry a club. Without the former he would fail to grow to be a giant. Similarly, bodily activity is essential to a soldier; good looks non-essential. Without the former he would 'cease to be' a soldier, by having to leave the army.

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[1] *On Hamilton,* p. 430 n.

But neither giant nor soldier is defined by such essentials. If they were, it would be because the circumstance or attribute had become part of the concept.

§ 392. What is ὁριζόμενον, or delimited, then, is always the marks or boundaries by which the right to a name is determined, not the qualities which make the existence of an object possible. An apocryphal salamander is as easy to define as a Tay salmon.

§ 393. 'What a thing really is' was what the ancients meant by ὅρος οὐσιώδης, *definitio realis*. But the expression has been employed more recently for notional definition as distinguished from so-called verbal definition.[1] Modern writers, accordingly, have been to some extent at cross purposes, in discussing ' whether Definition is Nominal or Real '. Is it of the meaning of the name (τοῦ τί σημαίνει τοὔνομα), or of the nature of the thing (τοῦ τί ἐστί)? Thus Sigwart says :—

'A definition is a judgement which states the meaning of a term denoting a concept. All logical definitions are nominal definitions. The demand for a *real* definition, containing the essential characteristics, arises from the confusion between metaphysical and logical problems. . . . It is a return to the Aristotelian demand that the concept should state the essence of the thing, according to his metaphysical theory. Now that we confess our ignorance in most departments of knowledge of the τί ἐστί, in the Aristotelian sense, it would be well also if logic were to relinquish the concept of the real definition.'[2]

Again, ' Kant has shown that in the empirical domain there are no definitions in the strict sense, since the characteristics which belong to the object—e. g., gold or water—can never be exhaustively enumerated, and hence the rule that the definition should be complete can never be complied with.'[3]

So Whately remarks:—

' We are concerned with nominal definitions only, because all that is requisite for purposes of *reasoning* is that a term shall not be used in different senses. A real definition of anything belongs to the science or system which is employed about that thing.'[4]

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[1] λόγος ὀνοματώδης. The Aristotelians used this phrase in this sense, but not, probably, Aristotle in the only place where he employs it (*Post. An.* ii. 10).

[2] *Logic*, i. 286, 288.   [3] Ibid. i. 106.

[4] Unless, however, ' nominal' means verbal and ' real ' means notional, I fail to see what Whately means by saying that in mathematics

§ 394. Mansel, on the other hand, says:—

' In the sense in which nominal and real definition were dis-
tinguished by the scholastic logicians the exact reverse is the
truth. Logic is concerned with real, i. e. with notional, definitions
only. To explain the meaning of particular words belongs to
the dictionaries or grammars of particular languages.' [1]

Hamilton [2] remarks:—' By a *real*, in contrast to a *verbal* or
nominal definition, the logicians do not intend "the giving an
adequate conception of the nature and essence of a thing ", that
is, of a thing considered in itself and apart from the conceptions

nominal and real definition exactly coincide ; for, he says, the name
(e. g. of parallelogram) expresses the nature of the thing, not all its proper-
ties but only its essential nature (*Logic*, c. i, § 7). He adds that the
same is true of logical, and most legal, and many ethical, terms.

[1] *Prol. Logica*, p. 189 n.

[2] Hamilton, following Krug, adds a third kind of definition, the Genetic.
He says :—' As examples of these three species the following three defini-
tions of a circle may suffice. 1. The Nominal Definition.—The word
circle signifies an uniformly curved line. 2. The Real Definition.—A
circle is a line returning upon itself, of which all the parts are equidistant
from a given point. 3. The Genetic Definition.—A circle is formed when
we draw around, and always at the same distance from, a fixed point
a movable point which leaves its trace, until the termination of the
movement coincides with the commencement. It is to be observed that
only those notions can be genetically defined which relate to quantities
represented in time and space. Mathematics are principally conversant
with such notions ; and it is to be noticed that the mathematician usually
denominates such genetic definitions *real definitions*, while the others he
calls without distinction nominal definitions' (*Lectures on Logic*, ii. 13).
Hamilton distinguishes them thus :—Nominal definitions are merely pre-
paratory explications. Real definitions presuppose the thing defined as
already existing (ὄν), so that the notion precedes the definition. In
genetic definitions the defined subject is considered as in the progress to
be (γιγνόμενον). The notion, therefore, has to be made, and is the result
of the definition, which is consequently synthetic.

I think, with Veitch (*Institutes*, p. 208), that ' genetic' definition is
merely a rule for giving concrete effect to a notion already conceived in
the mind. As regards ' real' definition presupposing the existence of the
thing defined, certainly we do not know that a line of which all the parts
are equidistant from a given point is a line that can return upon itself.
But neither, if we define a mule as a hybrid between a horse and an ass,
does this prove that there can be such an animal. Hamilton's example
of a nominal (=verbal) definition seems a poor one. ' Circle' as a word
is not equivalent to 'uniformly curved line' as vertebrate is equivalent to
'having a backbone', or hendecasyllabic to eleven-syllabled, or ' sugar' to
a thing sucked.

of it already possessed. By *verbal* definition is meant the more accurate determination of the meaning of a *word*; by *real* the more accurate determination of the contents of a *notion*. . . . The substitution of *notional* for *real* would, perhaps, remove the ambiguity.' [1]

§ 395. It is clear that ' signification of the name ' is an ambiguous phrase. So also is ' real nature of the thing '. Definition has no meaning if it is not notional. It is equally empirical, objective and the same thing for everybody whether we say that ' leopard ' means lion-pard, or describe the beast's colour, size, habitat, temper, and other attributes. I do not say its ' *distinguishing* attributes ', because this brings us back at once to the notional standpoint, which alone is subjective.

§ 396. The definition is the concept itself. Concepts of purpose are therefore more easily defined than others, because the purpose is usually consciously before the mind.[2] A razor is a cutting instrument for shaving. A house is meant to live in ; a bed to sleep in ; a chair to sit upon. A ruler is for drawing straight lines ; a helm for steering. Definition itself is defined by its object. A picture is meant to look at and a song to please ; but these circumstances are not so prominently before the mind, and therefore are no part of the definition.

§ 397. Besides final cause, scientific definition is often through efficient cause. Aristotle says, τὸ τί ἐστιν εἰδέναι ταὐτό ἐστι καὶ διὰ τί ἐστίν.[3] Such definitions state the way in which the effect is produced. Aristotle, who regarded the securing of distinct notions as a halting-place midway between the inductive and deductive stages of demonstration, connected definition with

[1] *Reid's Works*, p. 691 n.

[2] See Sigwart, i. 274.

[3] Mansel, however, remarks :—' Aristotle's opinion is not decidedly expressed ; but it seems probable that he regarded the *formal cause* only as available for purposes of Definition. For a material cause, properly speaking, has no place in attributes but only in physical substances ; and that which in the former is most nearly analogous to matter, viz. the necessary condition out of which the effect arises, may in such cases be identified with the formal cause. The efficient and final causes seem to be excluded, as not being contemporaneous with their effects, so that from the existence of the one we cannot certainly infer the other. Whereas the formal cause is expressly distinguished as τὸ τί ἦν εἶναι ' (*Aldrich*, p. 183). He adds :—' Aristotle's treatment of Definition has far more of a material than a formal character ' (Ibid. p. 193).

causation, and sought for definition through syllogism, the middle term or cause being the definition sought. What makes a (solar) eclipse? This may mean, either, what constitutes an eclipse, or else, what causes an eclipse. The logician gives the same answer as the physicist—'the interception of the sun's light by the moon.' A cathedral may convey to the vulgar the idea merely of a very splendid and ancient church. But it is correctly defined by that which· in ecclesiastical law *makes it to be* a cathedral, viz. the bishop's throne being in it. On the other hand a city is said to be constituted in the same way ; yet few would think of this in defining 'city'. The definition of 'island' as a piece of land surrounded by water combines the formal, efficient and material causes. Disraeli's epigram, 'Critics are painters who have failed,' suggests the *causa efficiens*, but not the formal cause of being a critic, viz. criticizing.

§ 398. Accidents, the older metaphysicians say, are undefinable because they cannot be demonstrated by a cause residing in their subject. There is nothing in the essential nature of man which makes him a laughing creature ; nor, I suppose, in a chemist's essential function which necessitates his putting coloured lights in his window ; nor in the vows and religious character of Carthusian monks which obliges them, or obliged them, to manufacture liqueur. But all this is far removed from the logical standpoint. Accidentality, from the logical point of view, is the absence of a universal, of any causal connexion. If it were only occasionally and casually that the interposition of the moon's body between sun and earth were accompanied by an eclipse, a solar eclipse could not be so defined.

§ 399. The dislike of the English mind for ideas and for universals, its preference for the unrelated fact and the particular judgement, is the reason why, as the late Bishop Creighton pointed out, it has never been fertile in definitions. On the one hand there is such a thing as an itch for over-defining,[1] which does not really advance scientific thought any better than the hand-to-mouth thinking of the 'practical man', content to 'muddle through' life's problems 'somehow'. But, though we must

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[1] 'Ideal' Ward, rebelling against the nebulosity·of the age, wished jestingly that he might have a new papal bull laid every morning with his muffin on the breakfast table.

be content in many matters with half lights, it does not follow
that ' mistiness is the mother of wisdom '.

§ 400. More metaphysical than logical, again, is the distinction
between definitions of Substances and those of Attributes, the
cause of the latter residing in the subjects in which they inhere,
the cause of the former residing in themselves.   Every οὐσίας
γνωρισμός, it is said, must state *what* by *why*.   But why a substance
is itself, who can say ?   ' Properly speaking,' writes Mansel,
'all Definition is an enquiry into *Attributes*.   Our complex
notions of Substance can only be resolved into various Attributes,
with the addition of an unknown *substratum*—a something to
which we are compelled to regard these Attributes as belonging.
Man, for example, is analysed into Animality, Rationality, and
the something which exhibits these phenomena.   Pursue the
analysis and the result is the same.   An unknown constant must
always be added to complete the integration.'[1]

§ 401. Definition, instead of being by cause, is sometimes *per
effectum*.   A fool is known by his much laughter, and might be
defined as one who laughs excessively ; for definition is not
seldom a response to the question, How am I to distinguish such
and such a class from others ?   A gentleman has been defined
as a man who can wear a fur-coat without looking like a theatre
manager.   The object of definition is mental demarcation.   No
doubt, on the other hand, it is generally understood that a defini-
tion claims to have a universal interest and to get below the
surface of things.   What is meant generally by this or that
attribute—e. g., the being a gentleman ?

§ 402. Such a question is answered either *divisively*, by taking
a wide generic idea and adding successive differences till it is
contracted to the exact sphere of the concept to be defined.
Or else by the reverse method.   The individuals, or subordinate
classes, to which the name required to be defined is applied, are
compared, and by finding wherein they agree we obtain our
definition.   What do I mean by ' a thorough gentleman '—putting
aside for the moment the element of gentle birth ?   I think of
five or six persons to whom I should instinctively apply the
expression, and reflect what they have in common.   Excluding
one quality and then another for which I esteem them, I fasten
on some point that seems essential—unselfishness or magnan-

[1] *Aldrich*, p. 192.

imity, it may be, combined with a certain distinction of manners. This *inductive* method examines attributes rather than, as the divisive method does, extensions. If the definition is faulty, it is in the divisive method because there are some members of the class which are not covered by the definition, or else because there are some members *not* of the class which are included in it ; in the inductive method it is because there is some part of the definition which does not apply to one or more of the constituents of the class, or in respect of which it is inadequate to express the characteristics which they have in common.

§ 403. Some logicians distinguish between 'Analytic' and 'Synthetic' definition—the former explicating the *content* of a notion, the latter stating the limits within which a name is *applicable*. If it be asked, What is *man*?, analytic definition replies, Man has the attributes of animality with rationality ; synthetic definition replies, Man is any rational animal—that is, all rational animals, and they only, are entitled to the name man. The distinction, however, if it is worth making, is merely the distinction between a statement expressed intensively and the same expressed extensively. Humanity is essentially rationality with animality. Man is essentially whatever is rational and at the same time animal. Every definition is analytic, and in every definition, not in 'synthetic' ones only, the *definiendum* may be regarded from one point of view as the real predicate. Toast is baked bread. All baked bread is toast.

§ 404. What has been said in the last paragraph but one about the divisive and the inductive ways of obtaining a definition bears on the question whether Division precedes Definition or Definition Division. It is plain that Specification and Generalization are mutually inverted operations. For if ships are divided as warships and non-warships, and the former class are divided again as ironclads, cruisers, gunboats, destroyers, and so forth, then, inversely, we compare these objects, when put before us, and find that they are all alike ships (higher genus), and that their characteristic (the differentia of their immediate genus) is the being used for warfare. Now suppose that, instead of dividing ships according as they are or are not used for war, we had given the dividing members names which did not explain themselves but needed definition, viz. navy and not-navy, the former being as before divided further as ironclad, cruiser, gunboat,

destroyer, and so forth.   Comparing these objects together, with a view to defining navy, and finding that they are all ships, and ships used for war, we should take this as the definition of navy. Or, possibly, the same comparison might have given us the definition, 'ships belonging to his Majesty.'

§ 405. The matter, then, may be looked at either way.   If we are finding a definition *inductively,* the division is supposed given, for we found the meaning of 'navy' by comparing the dividing members of the concept.   From this point of view Division precedes. *Divisionem excipit Definitio.* But we may proceed in the opposite order.   Dividing the class 'ship' by any pair of contradictory attributes we like, in this case navy and not-navy and being given the definition of navy as ships used for war, we proceed with this knowledge to divide navy empirically into different kinds of vessels intended for war, as ironclads, cruisers, and so forth.   Mansel, therefore, taking this point of view, prefers to say, *Definitionem excipit Divisio.*[1]

§ 406. Hamilton says :—' Division supposes the knowledge of the whole to be given through a foregone process of Definition or Declaration, and proposes to discover the parts of this whole which are found and determined, not by the development of the Comprehension, but by the development of the Extension.' [2] Aristotle prescribes the other order, in which Division prepares the way for Definition, securing that no member of the class to be defined is omitted in the induction.[3]   Plato also defined by dividing, though, Dr. Wallace remarks, 'his method of discovering the character of an object by continual dichotomy really *assumes* what is to be proved.   It arbitrarily takes one of two classes under which it seeks by successive divisions to bring the particular conceptions.' [4]

§ 407. The material on which thought is to work must always be given extraneously to the thinking act.   Until the concept to be divided has been defined, division is barren ; and until a class has been divided, no induction can take place with a view to definition.

[1] *P. L.* p. 194.
[2] *Lectures on Logic,* ii. 25.
[3] *An. Post.* ii. 13. 96^{b}15 and 97^{b}7.
[4] *Outlines of Aristotle's Philosophy,* p. 35.

§ 408. Division and Definition involve, as we have seen, three relations between concepts, Genus, Differentia and Species, of which the two former are together equivalent to the latter, and constitute a definition.

§ 409. The Greek dialectic turned very largely on Definition, the fourfold division of Predicates answering to the modern division of attributes into those which do, and those which do not, define.


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                        Attributes
          |                                      |
      defining                              non-defining
   |            |                          |            |
generic (= genus)  specific (= differentia)  proprium    accidens
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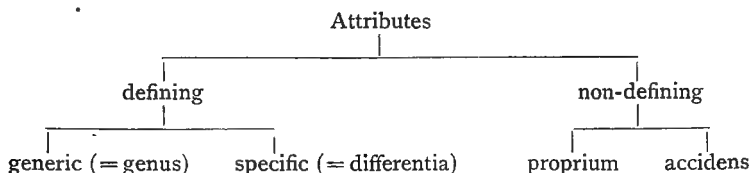
§ 410. Looking at the matter from the other side, the Heads of Predicables (αἱ πέντε) are connected with Division. In the whole to be divided (*genus*), each dividing member (*species*) is separated from the others by its *differentia*. Each species is equivalent, extensively and intensively, to the genus qualified by its own difference. But a species may also be co-extensive, though not co-intensive, with some other concept, or, in other words, be the sole possessor of some attribute which is not its differentia in the division, and therefore not part of its definition as given through that division. Such attribute is called a *proprium* of the species.[1] A warship is a king's ship, but ' warship ' does not mean ' king's ship '. Cats mew, and they alone ; or, if the sea-mew be objected, they alone among quadrupeds. But ' cat ' and ' a thing that mews ' have not, from the ordinary point of view, the same intension. One conceptual relation remains—that of *accidens*. This, from the logician's standpoint, is an attribute possessed by a part only of the species ; as whiteness by some geraniums and not others. Such an

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[1] Ἀνάγκη γὰρ πᾶν τὸ περί τινος κατηγορούμενον ἤτοι ἀντικατηγορεῖσθαι τοῦ πράγματος ἢ μή. καὶ εἰ μὲν ἀντικατηγορεῖται, ὅρος ἢ ἴδιον ἂν εἴη· εἰ μὲν γὰρ σημαίνει τὸ τί ἦν εἶναι, ὅρος, εἰ δὲ μὴ σημαίνει, ἴδιον· τοῦτο γὰρ ἦν ἴδιον, τὸ ἀντικατηγορούμενον μέν, μὴ σημαῖνον δὲ τὸ τί ἦν εἶναι (Ar. *Top.* i. 8. 103ᵇ7).

Accident, however, may become the differentia of a further division of the species into sub-classes.[1]

§ 411. Logic can only recognize the Predicables as relations in predication. Property and Accident call for a little further consideration from this point of view. Porphyry[2] distinguishes four kinds of *Property*, thus expressed by later writers :—

(1) That which belongs to the subject *soli sed non omni.* As, *homo grammaticus est.* Only men, yet not all men, can learn grammar.

(2) The same *omni sed non soli.* As, *homo bipes est.* All men are bipeds ; but so also are other creatures.

(3) *Omni et soli, sed non semper.* As, *homo canus est.* All men, and only men, get grey, but only during part of their lives. (*Bald* would be better than *grey,* for dogs and horses get grey.)

(4) *Omni, soli et semper.* As, *homo risibilis est.* Man, man only, and man always, is apt to be moved to laughter.

The two last kinds must, for our purpose, be combined in one, (3) becoming ‘ Man, and man only, is *liable to* get bald ’. We have then to distinguish three relations :—

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[1] Mr. Stock (*Logic,* p. 105) gives the following scheme, based on Aristotle’s division :—
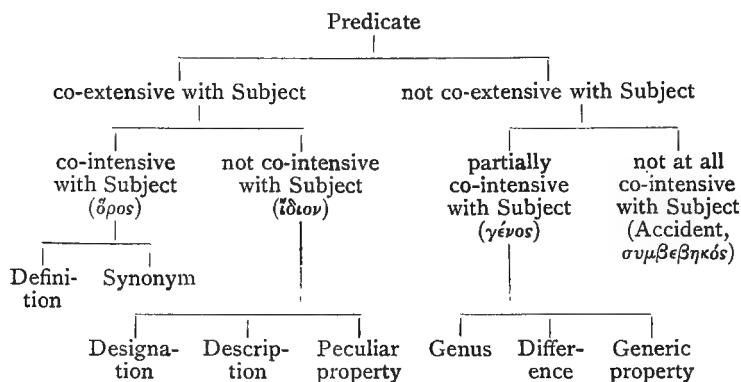
It is impossible that a predicate should not be co-extensive, and yet be co-intensive, with its subject ; for this would imply that certain objects, either in the subject or the predicate class, possessed all the qualities belonging to their class without possessing the qualities belonging to the other class, which are, however, *ex hypothesi,* the equivalent of them.

[2] *Eisagoge,* v. 1.

(1) Quod speciei soli sed non omni convenit.
(2) Quod speciei omni sed non soli convenit.
(3) Quod speciei omni et soli convenit.

Of these the second kind is merely the ordinary universal affirmative judgement, and subject and predicate are simply species and genus. All men are bipeds, and so are all geese. Two-footedness, then, is only a property in the loose sense in which the attributes of a thing are called its properties. The first kind is the judgement, 'Only *X*'s are *Y*,'='All *Y*'s are *X*'— except that we are given the fact that not all *X*'s are *Y*. It may appear at first sight that *Y* should be regarded in such a case as a *proprium*, especially if the *X*'s which are not *Y* are very few— e.g., 'It is peculiar to man to have the use of speech.'[1] But in strictness *Y* is a peculiarity, not of *X*, but of a sub-species of *X*.

§ 412. The only predicable relation which really expresses an ἴδιον, or specific difference, is *omni et soli*. Subject and predicate must have the same extension, and the proposition be convertible. It is true, as we shall see under Quantification of the Predicate, that this relation cannot be expressed in any proposition about 'every *X*'. Strictly speaking, Logic cannot recognize Property. The examples, for instance, given above of the fourfold Porphyrian distinction are all alike in form. How are we to know that 'homo risibilis est' expresses a different relation from 'homo grammaticus est'? On the other hand, the relation can be expressed in a compound proposition; e.g., 'All *X*'s, and they only, are *Y*', or in some other way. Thus we might say, 'A shop where a bush is displayed and a shop where wine is sold are the same thing.'

§ 413. The relation of a genus, a difference or a property to a species is a general and causal one. Accident, as a Predicable, is when the relation of predicate to subject is only occasional and so accidental. It is an accident whether a feather is yellow or any other colour, whether a picture is good or bad.

§ 414. The predicate is therefore accidental in particular and also in 'universal-concrete' propositions, there being no

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[1] See Ar. *Hist. Anim.* iv. 9, 16. ' Since man from beasts by words is known, Words are man's province' (Pope, *Dunciad*).

causal connexion or rule suggested. 'Some potatoes come from
abroad.' 'All these potatoes come from abroad.' 'Some boys
are tall.' 'Tom, Dick and Henry are tall.' It is true that the
tallness results from something in the constitution of the tall
boys, and the having been grown abroad may be inferred from
the nature of the potato. But this does not make any
difference to the particularity or generality of the propositions.
For example, 'Some clocks are always right' is a particular
proposition, and being always right is an accident contingently
true of clocks, though it involves a general judgement about
certain unnamed clocks.

§ 415. Logical books speak of a kind of accident called
Inseparable Accident. There can, I submit, be no such thing.
We may be uncertain whether a seemingly invariable con-
comitance has a universal character or not. Is it an inductive
generalization or only a fact true within the limits of our
observation? But it is impossible to suppose that two
phenomena which never have been, are, or will be found
separated are entirely without causal connexion, however
obscure it may be. The examples usually given are that the
mammals are always the warm-blooded creatures, and horned
animals are the ruminants. An 'inseparable accident' is for
the logician identical with property.[1]

§ 416. Accident is commonly defined as a quality which might
be absent from an object in this or that case without destroying

[1] Porphyry professes to disregard metaphysical questions. Yet, like
other writers, he bases his doctrine of the Predicables on a scheme of
natural kinds. A man, he says, may be 'more or less' angry, but he
cannot be more or less animal or rational. That is because in the former
case we have only the possibility of a particular judgement. A man
(like every other man) is always animal and rational, but only occasion-
ally angry. Besides, an emotion has degrees, a nature is constant. Sig-
wart also ignores the difference between the universal and the particular
when he says that 'it is only concepts within the same category which can
be subordinated to one another, and to speak of *red* as superordinate to
rose, or *intentional* as the superordinate concept to *murder*, is only con-
fusing' (*Logic*, i. 269). Not all, but only some, roses are red. If, on the
other hand, all murders are intentional, murder might well be defined as
intentional homicide, or be classed in an ethical treatise under the generic
head of intentional acts, with 'homicidal' for differentia. 'Among the
characteristics,' says the Professor on the same page, 'there is always one
which determines the nature of the synthesis by giving the category.'

our essential idea of it. Sleeves are essential to a coat, but not sleeve-buttons. A bad sixpence is no sixpence; a sixpence, however, would be as much a sixpence if the superscription were in English rather than in Latin. But the superscription being in Latin must be regarded as a property of British coins—unless, indeed, any other State uses that tongue. On the other hand, it would be logically an accident if this, that, or the other sixpence had a hole in it. A particular judgement only is involved. But all sixpences bear a legend in Latin. So it is a property, not an accident, of a triangle that its angles are together equal to two right angles. If it is of the essence of a square to be rectangular but the accident of a table, this is because there are round tables, hexagonal tables, and so forth. For the same reason it is essential to a table to be flat, accidental to be of this or that shape.

§ 417. Undoubtedly the flatness of a table is determined by the physical necessity of things. Nevertheless, the usual treatment of the Predicables *a parte rei* is extra-logical. Such names as genus, species, essence, property, accident, are borrowed from Ontology. They look to the constitution of the universe rather than to the form of the predication. Aristotle does not objectify the Heads of Predicables as the schoolmen do. To him they are 'the Four Differences'—originally three, but ἴδιον was subsequently broken up by him into Definition and Property. The Aristotelian point of view, however, is only semi-logical. Mansel gives the traditional doctrine in the following form:[1]—A predicate expresses either—

(1) the whole essence of its subject (*Species*); or

(2) part of the essence $\begin{cases} \text{the material part } (\textit{Genus}) \\ \text{the formal part } (\textit{Difference}); \text{ or} \end{cases}$

(3) something joined to the essence $\begin{cases} \text{necessarily } (\textit{Property}) \\ \text{contingently } (\textit{Accident}). \end{cases}$

§ 418. What, however, can we know about whole essences and part essences? 'Essence' for Logic is subjective only— not the necessary basis of the definition (about which basis we can form no judgement without a material knowledge of some things, or all things), but *given by* the definition. Even property, until the definition is given us, can only be distinguished from definition as simple commensurate from

[1] *Aldrich*, p. 67.

complex commensurate attribute. In metaphysics, on the other hand, property is a secondary attribute which flows exclusively from the essence of the object it belongs to—either from the genus (e. g., man being animal is appetitive), in which case it is called Generic Property, or from the differentia (e. g., man being rational is progressive [1]), in which case it is called Specific Property. Aristotle says that man is φύσει συνδυαστικόν, and φύσει πολιτικόν. But the question what flows from the nature of any object—e. g., that mammals do not lay eggs—is quite extra-logical. As well say that because a scarecrow is defined by its final cause, that of frightening birds by a human semblance, we must know that it wears clothes, and that this is an inseparable accident of a boggart, which never undresses, but the separable accident of a man, who does.[2] What, by the by, shall we say about a tailor's dummy, which only exists for the purpose of being clothed and yet is not always so ? The inner and essential nature of things is beyond the logician's ken. Is a sloe more essentially black than an Ethiopian ? If *habitat* has made the one black, soil may have made the other. And how is pure reason to say what secondary attributes flow from the essence of the subject to which they belong ? It is not of the essence of a lobster to be red ; yet boiling educes the redness from something in the creature's constitution.

§ 419. In the above elucidation of the inter-relation of concepts, Species has been regarded as the subject of which the rest are predicable. But the schoolmen made Species itself a Predicable (*species praedicabilis*), taking as starting-point the individual substance.[3] That which the individual is always and

[1]   Progress, Man's distinctive mark alone—
        Not God's and not the beasts'. God is. They are.
        Man partly is, and partly hopes to be.—(Browning.)

[2] Apart from the question of there being any humans who wear abso-lutely no clothing at all, wearing clothes is a property—at any rate among terrestrial beings—of mankind. Or, if horses and Dutch cows be objected, we may say, putting on clothes. 'An animal who, in a civilized condition, wears clothing' would be a logical definition of man.

[3] Aristotle, remarks Bain (*Logic*, App. A. p. 17), established 'a gradu-ated scale of Entia, each having its own value and position, and its own mode of connexion with the common centre', viz. the individual object, τόδε τι, *hoc aliquid*, to which all the higher Entia belong as predicates, and without which none of them has any concrete reality. The Realists, adopting the same scheme of ontological classification, contended on the

necessarily is his essence, or flows from it. That which a thing is at one time and not at another is accidental—e. g., the temperature of a given piece of water, or the posture of Agamemnon. This rose was fresh yesterday, but is withered to-day.

§ 420. It has been objected to the Heads of Predicables, e. g. by Professor Minto, that the list is heterogeneous, Genus and Species being the names of classes, Difference, Property and Accident the names of attributes. But Extension and Intension are only two aspects of the same thing, and we have already noticed (§ 309) that Genus and Difference may often grammatically change places. Species as the subject of predication must, no doubt, be regarded primarily as a class of things, since it is of things that attributes are predicated, but not as *species praedicabilis*. The predicate of any particular proposition is accidentally predicated. The predicate of any universal proposition, whatever its grammatical form, may be genus, differentia or property.

§ 421. These expressions, however, should only be used in reference to an act of definition. Logic has been unduly narrowed by attention being fixed on a limited scheme of concepts, classified in correspondence to a fixed order of the universe or the Cogitable Ideas ; whereas the field of general assertion is really boundless. Nevertheless, there is order in the universe,[1] and things have proper places into which

other hand that the individual is what it is only by participation in the universal. Just actions are so because they are stamped with the characteristics of justice. Justice is not merely a compendious name for a circumstance in which a number of actions happen fortuitously to agree. Probably, as regards a certain range of concepts we are all at heart realists—justice, beauty, goodness and the like. Either we must hold a *universale ante rem*, an eternal *cogitabile*, or be driven, step by step, to base everything on Chance. Bain, however, maintains that there is no idea of Government in the abstract (*Logic*, p. 178). Certainly we only recognize the universal in the particular ; yet such recognition implies a priority in idea. This Trendelenberg derides as 'the ancient *hysteron-proteron* of abstraction'.

[1] 'Were the various properties of things loose and unconnected, it would be impossible to reduce the Concrete Generals to anything like order. As an infinitely worse consequence, it would be found impossible to arrange natural objects into natural classes. For, the number of qualities in all objects, material and mental, being innumerable, we might fix with equal propriety on any one as the ground of the arrangement, and there could be no agreement among those investigating the kingdoms of

ordinarily to fall. So that, though we perforce use these
expressions (see above, § 386), it seems strange to speak of
'sweeping clean' as genus (or differentia) to 'new brooms',
because it would not probably occur to us as part of a definition.
Nor is 'cheaper than it used to be' part of the usual analysis
of the idea of bread. Such predicates, though stated universally,
are not part of that symmetrical arrangement of the world
according to which we observe that a great number of con-
comitant and incidental attributes group themselves round one
especial characteristic. On the other hand, the logician is
incompetent to say what is a natural and what is an arbitrary
and artificial classification. For him there is no fixed scheme
of genera and species. Everything may be conceived under
as many aspects as it has attributes, and may be defined
therefore in an equal number of ways.

§ 422. Before leaving this division of our subject, something
should be said about the sign of Negation as attached to Con-
cepts. Aristotle says that contradiction does not apply to simple
concepts, κατὰ μηδεμίαν συμπλοκὴν λεγόμενα, but involves predica-
tion.

A negated notion has no meaning out of predication, i. e.
apart from an implied or expressed assertion. If a notion
could be entirely simple, it could not be affirmative or negative.
For there is no such thing as an idea which states or denies.
So far from not-horse shutting out the idea of horse, or οὐκ
ἄνθρωπος of ἄνθρωπος, each idea involves and calls up the other, as
an idea. They are mutually creative. All that can be affirmed
or denied is attribution to a subject.

§ 423. But, since every concept is the complex of a higher
concept qualified by another concept (see above, § 295), it
necessarily contains within it an element which may be
expanded as a relative clause. An iron bar is a bar which is
made of iron, warm weather is weather of which warmness may
be predicated, a newspaper is a paper which gives news ; and

nature. Or rather . . . the God Who made all things has, happily for our
understanding and our practical convenience, instituted an order among
the separate qualities of objects, so that it is possible to arrange them
into orders which have such marks as enable us to fit them into our
material systems' (McCosh, *Laws of Discursive Thought*, p. 34).

even simple nouns like fork or stool are analysable into factors —an implement which is furcated, an article which is called a stool ; or, be the definition of the name what it may, at least it has one, and that a complex.

§ 424. If now we attach a mark of negation to the concept, it is not the entire concept which is negated—for this is impossible —but only the *relative assertion* contained in it, the inherence of the qualifying in the substantive part. ' Unhappy pair ' means a pair who are not happy.[1]

§ 425. Accordingly, simple nouns substantive, not explicated into their elements, do not usually admit the prefixing of a negative sign.   We do not say un-dirt or not-kettle.   Whereas adjectives, which are not concepts by themselves but wait to qualify a substantive, do take the negative.   We say illegal but not un-law, unfaithful but not unfaith—though these harsh expressions, it is true, have been used.   Undoubtedly *non* is often used with simple substantives—a non-voter, a non-gentle-man (we could not say ungentleman, though we say ungentle man and ungentlemanly).   But in such cases the negated word is understood quasi-adjectivally, a qualified notion being understood—a non-voting citizen, a person who is not a gentle-man.   Or the termination supplies the substantive element. In non-voter, disloyalist, nonjuror and many like words, the termination *er, ist, or*, remains unnegated.

§ 426. For a similar reason attributes commonly allow a negative prefix — imbecility, imperfection, nonconformity, illegality, injustice, irreverence, inhumanity, disreputableness. Only the adjectival part of the word is negated.   Unfriendliness is the quality of not being friendly, dissatisfaction is the condition of not being satisfied.   Even adjectives and participles are not wholly annulled by being negated.   ' Unfriendly ' keeps ' ly ' (sc. like) undestroyed, ' unloved ' keeps ' ed.'   A verdict which is unjust has still a certain character in relation to morals.   A noncommissioned officer is an officer who, though without a commission, is qualified by some character or other. Compare unceremoni-ous, unmerci-ful, inattent-ive.   The sub-

[1] Hughlings says :—' In a negative name the negative sign plays the part of an adjective, in a negative proposition of a predicate ' (*Logic of Names*). But the negation does not qualify the whole notion—e. g., wireless telegraphy is a kind of telegraphy.

stantive is οὕτως ἔχον, constituted if not in this way then in another.   Adjectives usually suggest some sphere of discourse. If a thing is said to be not blue, it is suggested that it has some other colour, not-obstinate is understood of character, not-pretty of outward form, ungentle of speech or manners.   Not-oviparous denies *ovi* but not *parous*.   ' The book is not James's ' leaves the possessive case-sign un-annulled, and implies that it belongs to some one else.   In 'not unlikely' *·not* destroys the *un* only, and leaves the *likely*.

§ 427. The element on which the force of the negation falls is that on which stress is laid by the voice.   ' Not four-footed ' might mean two-footed, or it might mean four-handed, like an ape.   If I deny that a spear is silver-headed, I may intend that it has a head of gold, or that it has a shaft of silver. Obviously silver-headed would not be negated by golden-shafted, for the spear might be both.   A sacrament which ' bonos vivificat ' at the same time 'malos mortificat ', though *malos* is the contrary to *bonos* and *mortificare* to *vivificare*.

CHAPTER XII

JUDGEMENT

§ 428. IN treating of Conception before Judgement we have followed the older and more òbvious arrangement. But modern writers, regarding the Judgement as the logical,[1] and the Sentence as the grammatical, unit, are for the most part inclined to invert this order, and to regard the notion as only an analytic element of judgement.

§ 429. Every act of consciousness involves a comparison. A concept, says Sir William Hamilton, ' is nothing but the result of a foregone judgement or series of judgements fixed in a sign.'[2] Mansel remarks :—' We judge individual objects to resemble one another before we gather them into classes. . . . According to Hobbes a proposition is but the addition of two names so coupled together that he that speaks conceives both to be names of the same thing. . . . He has overlooked the fact that apprehension is primarily the analysis of judgement, not judgement the synthesis of apprehensions.'[3]

§ 430. Mill, while welcoming Hamilton's view, asks how it agrees with the Hamiltonian doctrine that in judging we bring one notion under another notion. If a judgement is involved in every mental act, and if, as is generally agreed, every concept is built up by a succession of judgements and can be resolved into these again, how can the judging act be a comparison of concepts ? Such an inconsistency, Mill observes, ' coming from a thinker of such ability, almost makes one despair of one's own intellect and that of mankind, and feel as

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[1] ' An assertory predication is the unit with which Logic concerns itself' (Minto, *Logic*, p. 43). ' We do not enter upon logical development proper till we come to deal with the evolution and affiliation of judgements' (Bosanquet, *Logic*, i. 71). ' The sentence is the significant unit of language' (ibid. p. 40).

[2] *Lectures on Logic*, i. 117.

[3] *Aldrich*, p. xliii.

if the attainment of truth on any of the more complicated subjects of thought were impossible.' [1]

§ 431. Mill's own teaching is that judgement is not a comparison of concepts, but of the intuitions and presentations of experience. We obtain the judgement ' Water rusts iron ', not by comparing our *ideas* of water, iron and rusting, to see whether they *agree*, but by examining the *facts*, to see whether they *co-exist*.[2]

§ 432. This is surely to overshoot the mark. Bare examination of facts, that is of presentations to consciousness, could never assure us that water rusts iron, but only that a certain individual presentation is at this moment, or (if memory be granted us) was at some past moment or moments, accompanied by another presentation. To these presentations we cannot yet even give names; whereas the proposition 'Water rusts iron' implies the possession of the ideas of water and of rusting iron. And though we might indicate the subject by pointing to it, or saying 'this object', no general judgement can be formed about it unless the predicate is a concept fixed in a common name. Mere experience of co-existences is not knowledge. Fact must be brought under notion. For Nature to 'stand up and say, This was a man', she and we must have some general idea of what 'man' means.

§ 433. If this be so, we still have judgement pre-supposing conception, as much as if Hamilton's view of judgement as the analysis of a notion were correct. Yet, on the other hand, it is common ground that a concept is a fasciculus or integration of judgements—or at least of comparisons. Yes; but such comparisons are ultimately only the inchoate beginnings of judgement —an awareness in which subject and predicate are as yet not distinguished.

§ 434. The question before us resolves itself into the controversy as to the relative precedence of sensible and intelligible, of individual presentations and cogitable *universalia*. In truth, 'judgement and idea go *pari passu*.' [3]

If thought be analysed back and back into its dim rudiments, we come at last to a perceptive consciousness of impressions

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[1] *On Hamilton*, pp. 422–5.　　　　[2] Ibid. p. 426.
[3] Bosanquet, *Logic*, i. 34.

which is not yet judgement, and a grouping of unreflective beliefs which does not yet amount to conception. The Epicurean expression '*iudicia sensus*' is open to objection; for sense and judgement, though in an embryonic stage they may be indistinguishable, can never be the same thing. To judge is to interpret. Similarly, belief may be involved in sense—as contrasted, for instance, with plant sensitiveness—; yet 'sensory beliefs' is really a contradiction in terms. All we can say is that the ultimate constituents of thought refuse to be further dissected. A sensation as such can be neither true nor false, though James Mill says, 'To have a sensation and to believe that I have it is the same thing.'[1]

§ 435. A young child draws back its hand quickly from a red-hot coal or bar with a cry of pain. So far there is only perception, by which the externality of the cause of the sensation is distinguished from the sentient self: which perception is a rudimentary judgement. 'An impression on my consciousness is real.' At other times, touching boiling water or a highly heated dish, the child again recoils with the same cry of pain. But now it is able to separate the burning sensation from the visible presence of fire, and so to abstract the idea of extreme heat. The process of forming this conception was based on the previous 'sensory judgements', and the latter involved the beginnings of predication, that is of the recognition of qualities in things, which recognition is rudimentary conception.

§ 436. But it should be obvious that this question concerning the priority of Conception and Judgement is psychological, not logical. The logical Proposition presupposes, and is analysable into, Terms. The logical Term, on the other hand, does not suggest analysis into propositional elements. Terms, in fact, may be replaced by mere alphabetical symbols. It has been necessary to inquire at some length into the psychological structure of the Concept in order that we may understand the

[1] Lewes (see above, p. 83n.) regards 'primary judgements of sensation and intuition' as 'identical' judgements. Although they are 'sensible experiences of indubitably *a posteriori* character', yet 'all identical propositions are necessarily and universally true'; and 'all judgements, to be absolute, must be identical' (*Hist. Phil.*, ii. 463, 541). Accordingly, 'the whole stress of Verification consists in reducing propositions to identity or equivalence' (i. lxii)—that is, ultimately, either to a sensation or to a necessity of thought.

import of Judgement as conceptual. And in doing so we have found that Conception involves and presupposes a faculty of Comparison. But as a logical product the proposition is compounded of terms, not the term of propositions.

§ 437. The terms of a proposition together form an idea which the proposition asserts (or denies) to be true in certain, or in all, cases. The notion of S being P, of a P S, has actuality in experience. In vivid narrative events are often turned into pictures which, as all art is, are in themselves universal yet are to be understood as predicated of reality in the case described. Before ' Water, water everywhere, but not a drop to drink ' we must understand 'there was'. In the lines, 'Cannon to right of them, &c., volleyed and thunder'd,' on the other hand, the tenses might be replaced by present participles, ' volleying and thundering.' Compare the pictorial description at the beginning of *Enoch Arden*.

§ 438. A notion, then, or ideal conception, is an undeveloped judgement, and becomes a judgement by being asserted to be real. Thus, 'anima naturaliter Christiana—est.' Reality, then, ' is the ultimate subject in every judgement.' 'Judgement,' writes Dr. Bosanquet, following Bradley, ' is the reference of an ideal content to Reality,' ' a qualification of Reality by some ideal content.'[1] Again, 'Every judgement, perceptive or universal, might be introduced by some such phrase as, " Reality is such that —"; " The real world is characterized by —." '[2]

§ 439. 'A proposition,' writes Hughlings, ' is the exhibition of a compound name in analysis or synthesis ; and the copula asserts that the names it is interposed between may together form one compound name or be together replaced by one simple name.'[3] The Concept has the same elements as the Judgement, without that which is the essence of the judging act, assertion or belief.[4]

[1] *Logic*, i. 288; ii. 1.
[2] Ibid. i. 78, 79.
[3] *Logic of Names*.
[4] Mill says that the element of belief or assertion of reality is ' an essential element in a judgement, but may be either present or absent in a concept' (*Logic*, i. 420). I submit that it is essentially absent from a concept ; whereas judgement is 'a conscious reference to what actually exists ' (Ueberweg). Not, as we shall see, that in a general proposition

§ 440. Implicitly the same; for at first sight the Concept lacks the element of quantification. But it is important to notice (see above, §§ 298, 299) that the General Notion develops, not into the General Proposition, but into the Particular. 'A lame horse' implies a contingent possibility about horses. If all horses were lame, we should not trouble to qualify 'horse' by 'lame'. Accordingly, the General Notion involves both a particular affirmative and a particular negative judgement. It does not develop into a pre-indesignate proposition—'Horses are lame'—but into 'Some horses are lame, and some horses are not lame'. 'Cold weather' implies that weather may be cold, but need not be. 'Mad dog' suggests an exception. So that, whereas every ideal conception, involving no assumption of fact, is potentially universal, the judgement of experience wrapped up in it is necessarily concrete and therefore partial. The idea of hot water is referred to existence in the form, 'Some water is hot,' or 'This water is hot', but not in that of 'All water is hot'. Even a simple name, like ox, suggests that some animals only, or some things only, are oxen.

§ 441. On the other hand epithetical, appositive, or non-determining attributives involve a general proposition, stating inherence universally in a subject. 'Roaring cataract'—all cataracts roar. 'Man that is born of a woman'—all men are born of a woman (this, by the by, is a convertible proposition). The elements of the concept are not merely compatible.

§ 442. It is a corollary from this distinction that in a general proposition the idea in the subject-term cannot be qualified by the predicate, in the sense of being determined by it (*qualitas = differentia*) seeing that in such propositions subject qualified by predicate (e. g., mortal men) is co-extensive with the subject alone (men). In other words, a general proposition asserts that subject and predicate *must* form a compound name.

§ 443. General propositions about an individual correspond

the content of the subject-term is asserted to be real. But, given the condition which it expresses, then the reality of the consequent is affirmed. In other words, Reality is asserted categorically to have a certain nature. It is this assertiveness which is the *form* common to all judgements, the content of the terms being its matter. But form and matter cannot in judging be sundered; for assertion requires something to be asserted. Without the terms, the assertion is not unlike the smile which, in Lewis Carroll's book, remained after the Cheshire cat's disappearance.

in the same way to an epithetical designation. Will Legge is
honest—honest Will Legge ; London is vast—vast London.
Particular propositions about an individual are easier to throw
into notional form in Greek, with the help of a participle, than
in English. Yet we can speak of Philip drunk (Φίλιππος μεθὺς
ὤν) and Philip sober. Phrases like 'An excited House of
Commons shouted' are possible because we conceive of many
Houses of Commons, not merely of one with many moods.
Still, we might say 'a restored Cologne Minster'.

§ 444. The essential Form of Judgement is Assertion or Assent,
involving, of course, its opposite, Denial or Dissent. What is
always asserted, or denied, is the reality of a compound notion,
not simply existence in the speaker's mind, but objective reality.[1]
The universal or occasional inherence or non-inherence of an
attribute in a subject is affirmed.

§ 445. We start, of course, from the idea of the subject *being
there*. This is hypothesized in the general proposition, assumed
in the particular, singular, and concrete-universal. 'Fairy god-
mothers are benevolent.' The truth of the proposition is in no
way dependent on the existence of fairy godmothers *in rerum
natura* or anywhere else outside the common consciousness of
speaker and listener. If, and when, they exist, they are benevo-
lent. But 'Three fishers went sailing' assumes the existence of
fishermen, 'Some flowers are wild' that of flowers. If I say
'Harry is returned', or 'All my teeth are gone', I must mean in
the one case that there is such a person as Harry, in the other
that I once had teeth. 'My eye teeth have not yet come' asserts
non-existence in actuality, but implies potential existence. Even
'Some fairies are benevolent' implies the at least *literary* existence
of fairies ; a class familiar to the persons I am addressing is
being spoken of. If it be objected that the same is true of fairy
godmothers, we can easily find propositions about subjects which
are quite 'in the air'. 'Whoever has learned the *Encyclopaedia
Britannica* by heart is able to guess acrostics.' 'One who has

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[1] 'Mere presence in the individual mind is not the existence in question.
And indeed to speak of it as such would be to enter upon a vicious circle
which would stultify the judgement ; for it is essential to the judgement
to affirm a reality outside itself, and it would be too ridiculous that your
judgement should refer merely to the content of mine as the reality
asserted, and mine in turn to that of yours' (Bosanquet, *Logic*, i. 192).

never known the slightest care or trouble has lost the discipline of life.' In the following line of Prior's—

> He alone is blest who ne'er was born—

the subject cannot be supposed 'existent' in the ordinary sense.

§ 446. Judgement, then, asserts that benevolence in all fairy godmothers (so far as they exist), or that wisdom in some rulers (assumed to exist), *is real*. A general judgement declares the reality of a fact about a hypothetically existing subject; a particular judgement declares the reality of a possibility about an actually existing subject; a concrete universal or singular judgement declares the reality of a fact about an actually existing subject.

§ 447. 'In judgement,' says Dr. Bradley, 'we do not refer one idea to another, but the subject is always reality.'[1] 'The traditional subject, predicate and copula are mere superstitions. The ideal matter which is affirmed in the judgement no doubt possesses internal relations, and in most cases (not *all*) the matter may be arranged as subject and attribute. But this content is the same both in the assertion and out of it. . . It is impossible that this internal relation can itself be the judgement; it can at best be no more than a condition of judging.'[2]

§ 448. I presume the last words mean that, if there were no internal relation between the elements of the complex idea which is asserted to be real, there would be nothing to assert. Reality could not be asserted of a perfectly simple fact. But that internal relation must always combine a substantive and an attributive element.[3] In *every* case the compound idea of which

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[1] *Logic*, p. 14.

[2] Ibid. p. 22.

[3] Similarly Bosanquet says that ὄνομα and ῥῆμα, noun and verb, have been 'transmuted into subject, copula and predicate. . . . The judgement, however complex, is a simple idea. The relations within it are not relations between ideas, but are themselves a part of the idea which is predicated. In other words, the subject must lie outside the judgement, in order that the content of the judgement may be predicated of it. If not, we fall back into "My idea of the earth goes round my idea of the sun". What we want is, "The real world has in it as a fact what I mean by earth-going-round-sun" (*Logic*, i. 80, 81). In every judgement, even though immature or impersonal, 'there is a starting-point, or point of contact, with the ultimate subject,' viz. Reality; which point of contact 'is present in a rudimentary form in the simplest perceptive judgement' (i. 82).

reality is asserted or denied involves attribution to a subject. But, apart from the iconoclastic precipitateness of this writer, logicians must, I think, subscribe to his doctrine of the Real as the ultimate and underlying subject of all assertion. And this is equivalent to its being also the universal predicate. For in all judgement we assert an ideal combination to be real. Regarded, on the other hand, as subject we judge (in Bosanquet's words) that 'the Real *is such* that, under the ideal condition which forms the immediate subject of the judgement, it will furnish the ideal consequent which is expressed in its predication'.[1]

§ 449. Reality, then, being conditioned as *Y*, is *Z* (i. e. is *Z* reality). But we may take some smaller universe of discourse, *X*, assumed as real; and then *Y X* (*X* conditioned as *Y*) is *Z* (i. e. is *Z X*). Assuming *horse* as a real class, we say, 'A thoroughbred horse (horse conditioned as thoroughbred) is a stayer (a staying horse).' Mr. A. Wolf says : 'One can generally tell what particular portion or aspect of reality it is that elicits the several judgements from us. For instance, the judgement, "equilateral triangles are equiangular," is forced on us by a consideration of the nature of space. The nature of space is such that, given an equilateral triangle, it would need be equiangular as well.'[2]

§ 450. Impersonal verbs and sentences with an unexpressed subject have in the background some well-understood sphere of discourse within reality ; as, 'pluit'; 'It is finished'; 'Ite, missa est.' The interjection or ejaculation, the utterance of pain or triumph, those cries too with which Mary calls the cattle home, have self or some other immediately presented reality for subject—θάλασσα! Shame! Nonsense! and the like.

§ 451. But while the Real is the ultimate subject of all judgements, giving the expressed subject of the judgement a substantival and extensional significance, Dr. Bradley and his followers go too fast in denying the necessity of the threefold construction of the idea as predicated of reality. Subject, 'copula' and predicate are still essential elements. For the idea which is asserted to be real is, as we have seen, a complex. It is the idea of *X being Y*.

[1] *Logic*, i. 282. [2] *Studies in Logic*, p. 62.

CHAPTER XIII

IMPORT OF THE PROPOSITION

§ 452. WHAT now is the import of the idea of 'X being Y', which, as asserted to be real, becomes the proposition 'X is Y'?

Should it be found that the verb 'to be' is never a mere grammatical copula, but always retains the notion of *existence*, it will afterwards have to be determined, first, whether existence necessarily means actual existence *in rerum natura*; and, secondly, what it is that is asserted to exist, the subject, or the predicate, or both, or the one as qualified by the other. Again, it is important to ask whether the existence is absolutely or hypothetically asserted.

§ 453. The ordinary view of the 'copula' is the one stated thus by Veitch :—' The *is* with which knowledge begins is totally different from the logical copula, the *is* of comparison. The former implies a judgement of real existence ; the latter implies nothing more than a judgement of congruence or harmony between terms.' [1]

§ 454. Sigwart, on the other hand, pertinently asks :—' How does it happen that the verb " to be ", which is the expression of actual existence, assumes a formal function whereby it loses its meaning—nay, even seems to contradict it [as in the sentence, " A centaur is a fiction of the poets "] ? The remarkable thing is not that the ambiguity [as Mill asserted] has been so little noticed, but rather that all known languages agree in having it.' [2]

§ 455. It cannot be supposed that, when thought and language lay in the same womb, the simplest and most primary of verbs [3]

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[1] *Institutes*, p. 77.

[2] *Logic*, i. 100.

[3] Sigwart remarks that in 'cinnabar is red' the verb *is* serves to show that *red* is a predicate, and not (as it might seem to be if merely juxtaposed with *cinnabar*) a mere attributive. (In English, however, the adjective part of a notion usually precedes the substantive.) But, he says, ' in so doing it is a mere vehicle for the copula, not the copula itself; it does not constitute the judgement, but merely prepares the way for it '

was to be born with two entirely diverse meanings, or rather was to express at one time the metaphysical idea of existence (*as*, life-breath, *bhu*, beget), and at another nothing at all, but to have instead of a meaning a mere function, and that a superfluous one—the establishing of contact, or asserted co-existence, between juxtaposed thing and notion.   The phenomenon, whatever its explanation, extends to all persons, numbers, tenses, moods and participles—*am, art, is, are, wast, be, being, been,* ἔσομαι, *fuerimus,* and so forth.   Consider, for instance, the force of the inflected 'copula' in the words, ἦτέ ποτε σκότος, νῦν δὲ φῶς ἐν Κυρίῳ.

§ 456. Mr. A. Wolf, in his treatise on 'The Existential Import of Categorical Predication',[1] replies that, granting that the original, etymological meaning of the substantive verb implied existence, and existence only, this merely shows that the mind of primitive man was entirely occupied with what were believed to be real objects.   'But once the avowedly non-existent, too, received attention and was made the subject of judgements, then the copula, extended by analogy to those judgements also, must have become modified in meaning and implication.   For

(*Logic*, i. 94).   But, 'how does it happen that it is just the verb *to be* which we use in this way?'   He replies :—'The explanation is not difficult.   As Ueberweg (p. 162) rightly notices, it is a rule taken for granted that the things of which we speak exist ; there is no need of any express assertion ; we are not interested to know *that* things are but *what* and *how* they are.   When now it is desired, not merely to express predication by mere juxtaposition, but to give the form of the verb to the predicate, the verb *to be* offers itself just because it is so general and has by itself no content.   It is always presupposed ; but, in order that we may know what we wish to know, we need to have it determined more exactly as " being this " and " being thus ", just as the statement of existence is determined more exactly as " being here " and " being now ".   The predicate *red*, which by its form already denotes something appertaining to something else which exists, now appears as a modification of Being, being *red*' (ibid. p. 100).

This fits in with the view advocated in the text, that the interest of a proposition lies in the predicate, in the *kind of* existence possessed by the subject.   But for the expression 'a vehicle for the copula' I would read, 'a vehicle for the assertive energy of the judgement.'   A mere copula, or coupling word, is, as I endeavour to show below, a fourth wheel to the propositional tricycle.

[1] *Studies in Logic* (1905).

obviously the original meaning of "is" could not transform a non-existent into an existent subject.'[1]

§ 457. The last words assume what has still to be argued, viz. that *is*, meaning *exists*, in a categorical sentence implies the absolute existence of the subject. But, apart from this, Mr. Wolf's theory of the transformation of *is* from a verb of existence into a mere logical symbol appears to be far from satisfactory. In the first place, he does not explain what primitive man meant by 'Oxen exist slow-footed', or 'Your brother exists dead'. Secondly, primitive man must have sometimes spoken of things known to be non-existent and merely hypothetical: how did he express his thought then? Thirdly, it is far from clear how an implication of existence could have become 'extended by analogy' to judgements where non-existence is understood, or at least not excluded. But this, says Mr. Wolf, 'is what has actually happened. The substantive verb sometimes still has the same meaning as "exists"; at other times it is simply a sign of predication without any existential implication whatever';[2]—which, again, is to assume the point to be proved.

§ 458. It is true that the Greeks distinguished between ἔστι, *exists*, and ἐστι, *is*. Also that we commonly lay a stress on *is* when it means existence; on *est* in 'Homerus est', but not in 'Homerus est poeta'. Sometimes the two senses are combined in the same sentence; e. g.—

'Rather than be less, cared not to be at all' (*P. Lost*).

'I had as lief not be, as live to be

In awe of such a thing as I myself' (*J. Caesar*).

'Omne ens est unum.'

'There is that is destroyed for want of judgement' (*Proverbs*).

'God is, and is a rewarder of them that seek Him' (the Greek verbs are ἔστιν and γίνεται).

'Parvi sunt foris arma, nisi est consilium domi' (*Cic.*).

'The courts are open, and there are deputies.'

'Which is, and which was, and which is to come' (ὁ ὢν καὶ ὁ ἦν καὶ ὁ ἐρχόμενος).

'I should have been as though I had never been' (*Job*).

'Whatever is, is right.'

'Esse est percipi.'

'Nihil est incorporale nisi quod non est' (*Tertullian*).

[1] Op. cit. pp. 74, 75.   [2] Ibid. p. 75.

'One is with our father, and one is not.'

Where the existence is denied, as in the last two examples, no emphasis need be laid on *is*, so that 'one is not' might mean 'is not with our father'.

Other examples of the verb 'to be' implying absolute existence are such as these :—

'Je pense, donc je suis.'

'Times have been.'

'Troia fuit.'

'The child is not' (no *is* in the Hebrew).

'Esse aliquos Manes . . . nec pueri credunt.'

'Τὰ ὄντα.'

'The powers that be.'

'To be or not to be.'

'The thing that hath been is the thing that shall be.'

It was said to the early Christians, 'non licet esse vos'—you have no licensed existence. ἔστι, translated 'is possible', is really of this class—οὐκ ἔστιν οἰκεῖν, &c. ('there is no living,' &c.). We have to notice the large class of sentences beginning with (in English) 'there is'—e. g., 'Verily there is a reward for the righteous'; 'est modus in rebus'; 'sunt lacrimae rerum'; 'Of making of books there is no end.'

And yet 'there is' (correlated to 'where is?') must mean the same thing as 'is there', in which phrase *is* may be either 'existential' or 'copulative' (is a thing situated yonder). Take this—'seges est ubi Troia fuit'; or Tertullian's saying, 'ubi tres, Ecclesia est' (which might be expressed, 'ibi Ecclesia est'), or 'animus est ubi amat'; or Horace's words :—

> Est hic,
> Est ubi vis, animus si te non deficit aequus.

In 'Where there is smoke there is fire' the quasi-impersonal and the local sense of 'there' are indistinguishable. It seems strange to be obliged to hold that *est* is existential in 'non est peccatum nisi contra conscientiam', but copulative in 'omne peccatum est contra conscientiam'; existential in 'est unum necessarium', but copulative in 'unum est necessarium'. Can we fundamentally distinguish 'Nothing is a departure from law' from Tennyson's 'Nothing is that errs from law'; or 'All might have been well' from 'Cold to all that might have been'; or 'Rachel's children are not here' from 'Rachel's children are not'? '*Is*

there a man with soul so dead?', &c., is equivalent to '*Breathes*' or '*Lives* there a man', &c., and again is equivalent to 'No man *is* so dead of soul', &c., where *is* may be called a copula, unless we like to regard it as existential.

§ 459. It should be further observed that the subject introduced by 'There is' is never undetermined, but is always united to a relative clause or qualifying description.[1] 'There is a tide *in the affairs* of men *which taken* at the flood,' &c. This equals, 'A tide exists in the affairs of men, of such a kind that,' &c. 'There was an old woman' must be completed by '*who lived* in a shoe'. 'There are odd people *in the world.*' '*Est in conspectu* Tenedos.' '*Est regio in terris.*' 'There is a vale *in Ida, lovelier,*' &c. 'There' points to the coming qualification. In other words, actual existence is predicated not absolutely, but under such and such a mode. So 'sunt qui dicant', &c. Even the most absolute predications of existence seem to wait for some further elucidation. 'There is a land of pure delight'—but we go on, 'Where saints immortal dwell.'

§ 460. In many cases it is difficult to distinguish 'existential' from 'copulative' being. E. g. 'Cupio dissolvi et esse cum Christo.' 'Est deus in nobis.' πᾶσα πόλις φύσει ἐστίν (*Ar.*). 'Amicitia est inter pares' (cf. 'inter pares non est potestas'). 'All power is from God.' 'Quid est Imperatori cum Ecclesia?' 'Nihil est in intellectu nisi prius fuerit in sensu.' 'De rebus non apparentibus et non existentibus eadem est ratio.'

What shall we say, further, of expressions like 'in eo est ut . . .' 'It may be that . . .,' 'fama est,' 'mos est,' 'opinio est,' or the frequent substitution in Latin of verbs like *existo, fio, appareo, evado, audio, reperior, appellor, reddor,* &c., for 'copulative' *sum*? The Hebraism 'to be called' ('He shall be called the Son of God') means, 'His real nature shall be.'

§ 461. What is 'coupled' to a subject has frequently no grammatical congruity with it; e. g. 'ea dedecori sunt nobis'; 'sum

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[1] Bosanquet erroneously calls all that follows 'There is' a predicate. Hughlings is, I think, 'getting warm' when he remarks that, 'if the logical copula is to be taken to be anything more than a sign of predication, it must be taken as predicated of the subject; and the following noun or adjective is predicated of the copula' (*Logic of Names*). The latter statement is crude; but he seems to mean that the existence which 'is' predicates of the subject is a qualified, not an absolute, existence. The predicate is an 'appredicate'.

derisui inimicis meis'; 'hoc mihi volenti est'; 'omnia sunt recte'; 'adolescens in lubrico aetatis est'; 'necessitati a me est parendum'; 'interest (=inter rem est) ut te videam'; 'aeternas poenas in morte timendum est.' And what is coupled by the verb 'to be' in relative and interrogative clauses, such as 'quod non est, simulat, dissimulatque quod est'? In 'quae sit natura lucis ambigitur' it seems very far-fetched to say that 'sit' couples in thought 'quae' to 'natura'.

§ 462. In direct questions the 'copula' is usually placed first—'Is your bag ready?';—also after 'nor', 'yet' and other conjunctions. In some statements the predicate comes first, then the 'copula', and the subject last; as, 'stulti sunt qui putant,' &c., or 'Blessed are the poor.' In others, even in English, the 'copula' comes last in the principal clause; e.g. 'All equal are within the Church's gate'; 'All that therein is'; 'Follow the thing that good is'; 'The King of Love my shepherd is'; and of course very frequently in Latin prose. Also in legal language the verb.

§ 463. I venture to think that a slight examination of idiomatic forms begins to undermine the very existence of a merely coupling part of speech, a conventional mark of predication. Nor does one seem to be wanted. In every language it is frequently omitted; e.g. 'beati pacifici', 'traditores proditores,' 'place aux dames,' 'praemonitus praemunitus,' 'Forewarned forearmed,' 'uomo avvisato mezzo salvo,' 'First come first served,' 'The more the merrier,' 'Unkist unkind,' ὕδωρ ἄριστον, 'omnis homo mendax,' 'homo homini lupus.' In Latin and Greek the copula is dispensed with in elaborate as well as in pithy sentences. In English it is not seldom missing, especially in verse, when the sentence begins with the predicate; e.g. 'Happy the man who', &c.

§ 464. I argue below (§ 612) that we must distinguish in the word 'is' between the element of assertiveness and that of asserted 'being'. Any verb will serve as a vehicle for the assertive energy of judgement. Not so a mere 'copula'. If 'to be' essentially implies existence, it is easier to understand that in propositions *secundi adiacentis*, such as 'God loves us', 'Evil pursueth sinners,' 'Rira bien qui rira le dernier,' the idea of existence would become merged in the ῥῆμα expressing action or passion, than that a functional copula should do so.

The view that the verbal idea is here predicated directly, in which case the verb 'to be' is not necessarily implied at all in propositions like 'Pigs grunt', 'Fire burns,' is considered *infra*, § 498. Philologically, every proposition is the juxtaposition of a verbal *idea* with a noun. 'John comes' is 'John come-he'; 'I am glad' is 'I being-me glad'; 'sol splendet' is 'sol splende-ta'; σὺ τύπτεις is σὺ τυπτει-συ. But in Greek the verbs in -μι exhibit the original structure of predication best. The juxtaposition, at any rate with a certain stress of voice, implies an asserted relation between a subject and a notional category.

§ 465. Even quasi-imperatives sometimes dispense with the substantive verb. 'Sweets to the sweet'; 'Losers finders'; ἄγια ἁγίοις. Selden, on 'salus reipublicae suprema lex', says that 'esto' is the understood word.

§ 466. Language is only fossil history because it is embalmed thought. The simplest explanation of the so-called copula is that, whatever part may be conventionally assigned it in grammar, it always retains logically its primary meaning of *existence*.[1]

But not existence unconditional. What is predicated is existence after a certain mode. Even in the cases in which existence seems to be asserted absolutely (e.g. 'The child is not'; 'There are such things as angels'; 'The supernatural exists') we must usually understand 'in the world' or some other obvious determination. In 'Troia fuit' the past tense supplies a qualifying idea. *Esse* in 'esse quam videri' clearly awaits an attributive.[2]

§ 467. But yet again, even the qualified existence is only

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[1] 'Is', no doubt, acquires this or that force in predication, according to the character of the proposition and the nature of the predicate. In 'Hoc est Corpus meum' it carries a different significance from that which it has in 'The field is the world'. But the logician cannot decide such matters.

[2] No doubt, assertions of existence may be regarded as relational— X exists = X is existent. But this = exists as existent, which again might be phrased, 'exists as existing as existent.' And so on. Sigwart says :—'Herbart finds in the concept of Being complete unconditionedness and absence of relations ; and against this Lotze rightly shows that what we think of in the concept of Being is just this fact of standing in relations' (*Logic*, i. 77). Only, Being cannot stand in relation to itself. And so again 'X exists' cannot mean 'Whatever existence X has, it has it', or, 'If anything is X it exists'; for X in such a sentence is necessarily concrete. We cannot first hypothesize existence and then assert it.

asserted of the subject on the hypothesis or assumption of the subject having existence of some kind. 'All X's' means 'whatever X's there are.' 'All authority is from above' asserts that *whatever authority exists* exists from above. 'Salt is good' means that salt, wherever found existing, is found existing as good. A proposition in the form 'A mountain made of "one entire and perfect chrysolite" would be worth more than all Essex arable', implies the non-existence of its subject. Yet it is still true that if it existed it would have an existence determined as worth more than arable Essex. Even 'Queen Anne is dead' implies that the mode of existence or being possessed by Queen Anne is that of deadness.

§ 468. I have purposely taken an illustration which presents difficulty, and which suggests other propositions in which the existence or being asserted is non-existence. For example—

No existing MS. of Livy is complete.

Nihil est quicquid in saeculo est.

An idol is nothing in the world.

The King is a thing of nothing.

If, however, anything can be said to be a thing of nothing, there is no reason why a subject of discourse should not be said to have its being as non-existent (e.g. '"Gorgons and hydras and chimaeras dire" are non-existent'). And this goes further than 'exists as dead'; for a dead person may have a very real existence in the love and recollections of his friends or in the works which follow him, to say nothing about any other state of existence. But we shall have to return to the question whether existence in predication means actual, palpable existing in space and time or only objectivity in thought.

§ 469. To return. The interest of every statement resides in the predicate. We do not want to know that a thing exists, but *how* it exists.[1] A predicate, then, is logically adjectival, and grammatically agrees with its subject in gender, number and case. It expresses the *mode* in which the subject *has its being*, not *has being*, simply, but has whatever being it has.[2] X-ness,

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[1] 'All judgement whatever is an attempt to make explicit the nature of Reality' (Bosanquet, *Logic*, i. 146). Yet Judgement does not say baldly, 'Reality is Y,' but, 'Reality, conditioned as X, is Y' (All X is Y).

[2] Cf. 'Then shall every man have *his* praise of God' (1 Cor. iv. 5, R.V.). Some will have none.

where it exists, does not exist without *Y*-ness. As the substratum of a judgement, not of existence, but of co-existence, however, the verb 'to be' may in a sense be regarded as coupling ideas, and so as a copula.

§ 470. But this neutral and non-committal import of *is = exists* applies not only to general and abstract, but also to particular, singular, and concrete universal propositions, though in these the existence of the subject is assumed. 'Some birds are tuneless'; 'My brother is married'; 'All the cups are broken.' The subject in each case is said to be, to have whatever being it has, in a certain way. It is the same, too, with negative judgements.

§ 471. The circumstance, then, to which we must next attend, that some kinds of judgement imply the existence of their subjects, while others do not, is not really affected in any way whatever by the question whether the verb 'to be' does or does not always mean to exist. It is to the subject, and to the form of the sentence, that we must look to ascertain whether it is 'existential', not to the 'copula'.[1]

§ 472. Many pages have been written on the existential import of propositions. Yet the matter is really a simple one. Concrete propositions do, while abstract propositions do not, imply that their subject actually exists. The former are assumptive,—they take as granted the empirical and concrete existence of the thing spoken of—John; five sailors; our garden; some islands; all the chairs. The latter are hypothetical and general in character—all good men; a tidy garden; the wise; African lions; eternity; to die; and a number of forms of direct hypothesis—'If you are a good boy you shall have a penny.'

§ 473. To make the point turn on mere quantity is crude. It is usually said that, in affirmative forms at any rate, universal

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[1] Sigwart adheres to 'the proposition, so strongly emphasized by Kant, that the predicate *to be* adds nothing whatever to the *content of the idea as such.* Whether I say "*A* is", or "*A* is not", my thought of *A* is just the same; the meaning of the statement itself demands that neither more nor less shall be present in the actual world than just the *A* thought by me. Thus "being" forms no part of the subject-idea, no "real predicate", as Kant says; it merely expresses the relation of the *A* which is thought to my faculty of knowledge' (*Logic*, i. 76). In the same way Hume says:—'The belief of the existence joins no new ideas to those which compose the idea of the object' (*Treatise*, I. iii. 7).

judgements leave the existence of the subject undecided, while particular ones imply it. Yet 'all the water-babies' is at least as 'existential' as 'some water-babies'. What can totality or numerical more or less have to do with the matter? Mr. Wolf, finding that the quantitative divisions cross one another, comes to the conclusion that 'no line of formal demarcation' is to be trusted.[1] I do not think, however, that an elaborate examination, such as he offers, of a number of various kinds of judgements is necessary. It is an easy principle to be grasped that what is named as concrete and perceptive is assumed to exist; whereas an ideal content, having an abstract and notional reference, leaves it an open question whether, empirically, there are any objects which answer to the conceptual conditions of the name. Every concrete proposition is *thetic*, positive and assumptive; every general proposition is *hypothetic* and suppositive.

§ 474. Negative judgements follow the same rule as affirmative ones. 'No parallel lines meet' is abstract; 'None of the lines on this paper meet' is concrete. So are, 'Some of the lines do not meet,' and, 'This pair of lines does not meet.'

§ 475. The only difficulty which arises is when a general statement is made about a concrete thing or things. 'This pair of lines will never meet.' 'St. Paul's is always open.' 'Some men have greatness thrust upon them.' 'Some people,' observes old Robson in *Cynthia's Lovers*, 'are always talking about matrimony.' But even in such propositions, though, no doubt, the existence of the subject is assumed, there is a hypothetical and abstract element too. 'If this pair of lines be traced to any point.' 'If St. Paul's be visited at any time.' 'If you listen to the talk of some people at any moment.' And so forth.

§ 476. An abstract character belongs also to propositions beginning with 'all of the', when followed by a determining clause. 'All the clothes that (= whatever clothes) I have on my back' might be said by a naked man, and 'You are welcome to all the gold mines I ever possessed' by a beggar. In such propositions 'the' is not simply demonstrative, but marks the antecedent to a relative clause coming afterwards. Again, 'All the gifts of Nature are for our good' is not purely concrete; for

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[1] *Studies in Logic,* p. 124.

‘the gifts of Nature’ means, ‘the gifts which Nature bestows, whatever they be.’

§ 477. As regards Singular Judgements, Mr. Wolf says :— ‘ It is noteworthy that, as regards existential implication, Dr. Venn and Dr. Keynes class singular propositions with particular, not with universal, propositions.’[1] They ought rather to be ranked with concrete universals,—‘ The earth goes round the sun ’ with ‘All the planets go round the sun ’, not with ‘Some planets are uninhabitable’ nor with ‘All planets have a visible movement ’.

§ 478. A distinction is drawn in this matter by some writers between categorical and hypothetical judgements. The categorical judgement, according to Bosanquet, ‘affirms the existence of its subject.’[2] Dr. Venn declares that the hypothetical form implies a doubt. The former writer seems to use the word ‘categorical’ in the sense of concrete. We have seen that a categorical general proposition affirms hypothetically only. It does not differ essentially from one expressed in full hypothetic form— ‘Every YX is Z ’ from ‘ If X is Y it is Z ’. It is true that, when a doubt has to be expressed, the latter form of sentence is usually employed. ‘ If X were Y it *would be* Z ’ necessarily implies doubt, and something more. But, as Mr. Wolf observes, ‘ the hypothetical form, as such, expresses neither peculiar certainty nor peculiar doubt, but simply connexion of content.’[3] To add ‘ if any exist ’ to a general proposition, whether expressed in full hypothetic form or not, is superfluous. But such a doubt may find a place in an *assumptive* proposition—e.g. ‘ Some of my eggs, if I have any, are for you.’

§ 479. The question of existential implication in the subject of judgement has been usually confused with that of the existence of the subject as qualified by the predicate.[4]

[1] *Studies in Logic*, p. 119. [2] *Essentials*, p. 116.
[3] *Studies*, p. 79.
[4] The late ‘Lewis Carroll’, in his whimsically ingenious *Symbolic Logic* (pp. 165–170) deprecates the ‘bated breath’ with which those whom he refers to by the (he hopes inoffensive) title of ‘the Logicians ’ have usually spoken of the Copula. His own dealing with it, though parrhesiastic enough, trips over the confusion, here pointed out, between the implication of the absolute existence of the subject (implied by ‘ some of the ’, ‘none of the,’ in his amusing but misleading illustration) and the assertion of the determination of a hypothetical subject by the predi-

The universal negative general proposition, *E*, from this point of view, appears to have a dissimilar implication from the universal affirmative proposition *A*, which stands isolated.

> *A*—All men are mortal.
> *E*—No men are immortal.
> *I*—Some men are wise.
> *O*—Some men are not wise.

Now, *I* may be expressed thus—'There are some men who are wise';[1] and *O* thus—'There are some men who are not wise'; and *E* thus—'There are no men who are immortal.' But *A* cannot take the form, 'There are all men who are mortal.'

O, like *I*, affirms, not denies, existence. We do not say, 'Some dangerous snakes are non-existent' (unless we mean, are extinct), but 'Some snakes exist which are not dangerous'. *E* denies existence—'No elephants fly': flying elephants are non-existent.[2] *A* cannot affirm existence. 'All elephants are

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cate. He argues, for example, that *I* and *E* cannot both assert or imply existence, being contradictories. So that, if 'Some *X*'s are *Y*' implies that there is a class of *X*'s, 'No *X*'s are *Y*' implies that there is no such class! The contradiction, however, is not between the two subjects (*X* in either case) but between what is said of them. 'Lewis Carroll' further contends that, if *I* asserts existence, *A* 'makes the same assertion, since it necessarily *contains* a proposition in *I*'. But this is a confusion of thought. 'All', no doubt, includes 'some' of the same thing; and if, after alluding to 'some seven-leagued boots' (in a way which implies that there are such things), I go on to speak of 'all seven-leagued boots', I may be presumed to be still thinking of them as actual objects. But 'some' of one thing is not contained in 'all' of another. 'Some' in fact may be larger than 'all'. It may stand for ten, and 'all' only for four. 'Some' must express a positive quantity, but 'all' may stand for any quantity down to and including zero.

[1] This is a more correct phrase than 'There are some wise men'. For *some* is properly partitive; and, if 'some men' means a portion of the human class, 'some wise men' should mean a portion of the wise-men class. The French *il y a* is noticeable. 'Il y a fagot et fagot' (Molière). Balzac says:—'Dans tout homme de génie il y a un enfant.' Usually partitive *de* follows—e. g. 'Il a de jolies peintures'.

[2] Dr. Case (*Encyclopaedia Britannica*, art. 'Logic') quotes and criticizes Brentano, as having tried to put all reasoning upon an 'existential' footing by turning universal affirmatives into negatives. Thus—

> All men are mortal,
> All professors are human,
> Therefore all professors are mortal

becomes

> There is not a not-mortal man,

heavy': all heavy elephants are—what? To fall into symmetrical place with the other forms, *A* must universally deny existence—'There are no such things as non-heavy (light) elephants.' *E* hypothetically denies, categorically affirms. *A* categorically denies, hypothetically affirms.

§ 480. An affirmative general judgement, however, does seem to stand on a footing of its own. The reason is that the *some* of particular judgements stands for a fixed number of objects, whether known or unknown. And the *none* of the universal denial is a definite limit or starting-point, which cannot be less or more, whether the universal be general or concrete. But the *all* of a general affirmation represents what is potentially unlimited. It is the distributive aspect of an ideal totality, and what it stands for varies with the size of the total. Unlike *some, a few, thirteen, many,* but like *most, almost all, half, two-thirds,* omnitude is necessarily a relative idea. In a concrete universal judgement the total to which 'all' (like those other expressions) is relative is an ascertained one. In an abstract universal judgement it is unknown.

§ 481. We can say, then, 'Four hundred million Chinamen exist,' meaning that Chinamen exist to the number of 400,000,000. Or we can say, 'No ungentlemanly Spaniards exist,' putting their number at zero. But 'All gentlemanly Spaniards exist' makes no sense. Is it that they exist to the extent of *all*? But all what? Not to the extent of all Spaniards, which would give a good meaning; but 'Gentlemanly Spaniards exist to the extent of all gentlemanly Spaniards',[1] which gives no meaning at all.

> There is not a not-human professor,
> Therefore there is not a not-mortal professor.

Had the minor premiss been, 'Some professors are human,' we should have had in *Darii*—

> There is not a not-mortal human,
> There is such a being as a human professor,
> Therefore there is such a thing as a professor who is not immortal.

A syllogistic system of this kind would be rather contra-existential than what is usually meant by existential, its major premisses all denying existence. In common speech such reasonings are usual enough. 'There is not a plumber in the town that I have not tried, and not one that I have tried who has not been a failure. It follows (*Barbara*) that there is not a plumber in the town that has not been a failure.' And so in other moods.

[1] Notice that 'No *X* is *Y*' means that no *X* is a *YX*, no *X* is an *X* existing in the mode *Y*. 'Every *X* is *Y*' on the other hand cannot naturally be explicated in the form, 'Every *X* is a *YX*' (as though *X* were

Or thus—given the notion *YX* (the notion of *X* being *Y*), we can say, 'No instance of it exists,' or, 'Some instances of it exist'; but we cannot say, 'Every instance of it exists,' nor yet, 'Some instances of it do not exist.'[1]   Here *A* and *O* group together, while *E* goes with *I*.

§ 482. Concrete universals and singulars, like general propositions, assert merely the mode of the subject's existence, even while that existence is assumed.   Given 'Jenkins herds swine', we can say, 'There exists one Jenkins, a swineherd,' but not 'There exists swineherd Jenkins'.   'None of the knights are faithless' will not give us 'None of the faithless knights exist'; though 'No knights are faithless' is equivalent to 'No faithless knights exist'.

§ 483. The question which has just been discussed is, it will be observed, no more affected by the meaning of the 'copula' than the existential character of the subjects of propositions was affected by it.   It does not matter whether we begin, 'Any *X*'s which may exist,' or, 'Some of the *X*'s which do exist': in either case the proposition goes on—'*have that existence* in the form of *Y*.'   But since every judgement can be expressed as an explicit affirmation (*I, O*) or denial (*A, E*) of existence—even the concrete universal affirmative 'All my friends were kind' can be phrased 'There did not exist among my friends one unkind one'—this is further evidence that the idea of existence underlies every statement, and that it is absurd to say that in 'No head masters are uneducated men' *are* is existential, while in 'All head masters are educated men' it is a mere hook and eye.

§ 484. To glance briefly at the question, what is meant by judged existence.   I do not think that, for logical purposes, any distinction can be made between actual existence to the senses, apprehended by inner or outer intuition, and existence in fancy or literature.   Existences of the latter kind are an objective fact, when we judge anything about them, as much as those which can be touched, tasted and handled.   I state something

being identified with the *Y* portion of itself), but only in the form, 'Every *X* is an *XY*,' is a *Y* existing in the mode *X*.

[1] We might, it is true, say that every possible case of *X* being *Y* is actually realized, or that some possible cases are not realized.   But 'every *YX*' means 'every *X* that is *Y*', not 'every *X* that *might be Y*'.   (In such a sentence as, 'All the dancing men have partners,' 'dancing' is used idiomatically.)

about basilisks, not about my notion of basilisks, and the state-
ment, however playful, is propounded as a judgement about those
creatures. If I say that Hamlet killed Polonius, or that some
elves have bats' wings, the reference is to an assumed reality,
as between me and the person to whom I speak, not less than if
I stated something about Charles Dickens or about a species of
rabbits ; nor would a proposition respecting Cymbeline or King
Arthur be more 'existential' if I were thinking of, or referring
to, those princes as historical personages. Every proper name
assumes existence. The elaborate disquisitions, therefore, of
Mr. Wolf and others on existence and reality appear to me to
be a waste of ingenuity. If a distinction between *being* ($\mathring{v}\pi\alpha\rho\xi\iota s$)
and *existence* ($o\mathring{v}\sigma\acute{\iota}a$) be insisted on, in that case the logical
proposition is not concerned with the latter, but only with the
former. No doubt, actual existence *in rerum natura* may be
explicitly asserted or denied. But the propositions, 'Centaurs
are a fiction of the poets,' ' Briareus was a purely imaginary
being,' ' Earthly perfection is nowhere to be found,' assert some-
thing of centaurs, Briareus and earthly perfection, not about
names, or about my subjective individual idea of those things.

§ 485. The existential implication of predicates does not
require much discussion. The predicate of a general proposi-
tion is not hypothetical like the subject, but assumed as a known
category; yet it is not implied that there is necessarily an
empirically existing class corresponding to it. I may say,
'Every three-headed giant eats and drinks '; or I may say,
'Every three-headed giant ought to marry a three-headed
giantess.' I must not be supposed to assert by implication that
there is in actual experience a general class on which that duty
lies. A predicate is merely a notion, either already existing in
the mind, or one the elements of which are already possessed.

§ 486. The predicate of a concrete or perceptive judgement is
equally notional. But if the subject is assumed to exist, the
qualities attributed to it must be thought of as existent. And,
generally, *so far as* any subject exists, what is truly asserted of
that subject must exist also. Only, the existence of the predicate
is not necessarily limited to that of the subject.

CHAPTER XIV

IMPORT OF THE PROPOSITION (*continued*)

§ 487. HAVING discussed the nature of the 'Copula', we are able to proceed with our analysis of the Import of the Proposition.

It has been pointed out that general propositions assert something of the subject on the supposition of the subject being there. Its actual existence is not necessarily assumed. Nevertheless no subject can be resolved into pure conditionality. Reality as the ultimate subject underlies the supposed case. But moreover, within Reality, there is always some lesser sphere or universe of discourse which is *assumed*. Thus, in 'Hard words break no bones', 'words' is the sphere, the existence of which is assumed, while 'hard' is the condition of what is asserted about this sphere. Words, if hard, or though hard, break no bones. 'Liars need long memories.' Of men (a known class), if they are liars, the need of long memories may be predicated.

It may not be always easy to name the sphere of an assertion— e. g. 'Love laughs at locksmiths.' But it is always there, or, in the final resort, as has been said, the sphere is the Real. The universe of discourse is the largest circle in the subjoined diagram; the condition the smallest.
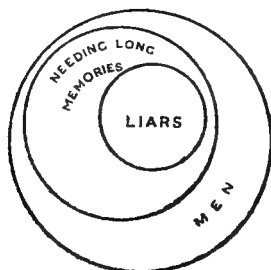
If the sphere of discourse ('men') fell within the circle which represents the predication ('needing long memories'), it would

not need to be conditioned (all men need them). It would intersect that circle if other beings than men needed long memories.

§ 488. It is plain, then, that this assumptive element of the subject runs through the whole proposition, and, even if unexpressed, underlies the predicate. Thus—No *YX* is *Z* (A watched pot never boils) is equivalent to, No *YX* is *ZX* (No watched pot is a pot that ever boils). Conversely, No *ZX* is *YX* (No pot that ever boils is a watched pot). Again, No *Y* is *ZX* (No watched object is a pot which ever boils); and No *ZY*— or no *YZ*—is *X* (Nothing which, being watched, also boils is a pot).

§ 489. The constant and assumed element in a proposition is the *substance* in which both the subject or conditioning attribute and the predicate attribute inhere; and the asserted or denied coinherence of two attributes in a common substance is that synthesis which we call predication. In every affirmation is a consciousness not of identity but of unity. For logical purposes we can speak of a plurality of substances. But in the final analysis the one and sole substratum of all varying determinations is the Real[1]; since apart from the determining qualifications all substances must be thought as entirely alike.

§ 490. The qualification of Reality is either notional or phenomenal. The latter is asserted in the proposition, which must be either true or untrue. Aristotle says: λόγος ἀποφαντικὸς οὐ πᾶς ἀλλ' ἐν ᾧ τὸ ἀληθεύειν ἢ ψεύδεσθαι ὑπάρχει.[2] Observe that while the combination of two elements in a notion (e. g. friendly act) implies the possible coinherence of the corresponding attributes in the same substance, the conceptual combination of a negated idea with another element (e. g. unfriendly act) does not imply the impossibility of their coinhering, but only the possibility of their not coinhering, in one substance.

When the impossibility of coinherence is asserted, we have the universal negative. So that we can either say, with Herrick,

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[1] Theologically, God the Word, the Image of the Father's substance, upholding (φέρων) all things by the utterance (ῥῆμα) of His potentiality (δύναμις). *Heb.* i. 3.

[2] *De Int.*, 4.

' No man at one time can be wise and love,' or, ' No wise man falls in love,' or, ' No man who falls in love is wise.'   No *X* is both *Y* and *Z*.   That is, no *YX* is *Z*, and no *XZ* is *Y*.   If anything is both *Y* and *Z*, it follows that it is not *X*.

§ 491. Coinherence is sometimes expressed by ' and '.   ' Give him an inch and he will take an ell.'   ' Divide et impera.' ' Scratch a Russian and you find a Tartar.'   ' Tange montes et fumigabunt.'   ' Lang and lazy ' (i. e. long people are lazy). Sometimes an antecedent and a consequent clause are juxtaposed without *and*—e. g. ' brevis esse laboro, Obscurus fio.'

> Give me but what this riband bound,
> Take all the rest the sun goes round.

Or ' tolle periclum, Iam vaga prosiliet frenis natura remotis '.

§ 492. Coinherence does not imply that the subject and predicate ideas stand on an equal footing.   In universal negative and particular affirmative propositions, which are convertible simply, no priority can be assigned to either, though the point of view is different according as we judge no *S* to be *P* or no *P* to be *S*; some *S*'s to be *P* or some *P*'s to be *S*.   But in universal affirmatives, the hypothetical antecedent must be regarded as having logical priority to the consequent.   Bosanquet maintains that the subject is not *earlier* than the predicate.[1]   ' It is absolutely impossible that priority in time should subsist between the parts of a completed judgement . . . You cannot have an *S* first, and then tack a *P* on to it.'[2]   Of course, nothing can be a subject without expecting a predicate, the two ideas being correlative. But equally no one can be a mother without *eo ipso* having a son or daughter.   There priority in time comes in.   But what we are concerned with is rational precedence.   No doubt a would-be predicate often waits for a subject.   ' The bell tolls, some one is dead ?   Who is it ?   The mayor.'   Grammatical subject, however, is here logical predicate.—' The dead person is the mayor.'   Compare, ' The soul that sinneth, *it* shall die.'   We are dealing, however, rather with general propositions; and in

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[1] In the Concept some languages, as French and Latin, put the adjective after the substantive, the generic idea coming first and then its qualification.   In English, on the other hand, the quality first presents itself to the mind, the subject in which it inheres lying beyond in the background.

[2] *Logic*, i. 85, 86.

these it is clear that the conditioning idea takes in the order of reason precedence of that which is predicated.

§ 493. Yet, in another sense, the predicable content—though not yet as predicated—comes first, for in judging (at any rate in concrete judgements) we place what is more immediately presented to our cognizance, and perhaps is now experienced by us for the first time, under a notion which we already possess. Knowledge is the bringing what is less known under what is better known; otherwise the judgement, which is meant to elucidate what is obscure in the subject, would bring no light to the mind. Representing a judgement, then, as $S J$, where J is that which is judged about the subject, S precedes J. But representing it as S is P, P the predicable but not yet predicated content, is actually possessed earlier than S.

§ 494. All judgement, then, brings object under concept, the That under the What. This is so even in assertions about abstractions so vague as to be inconceivable, such as Infinity,[1] and in the identification of singulars—'Thou art the man'; 'The person you see there is the Duke of Omnium'; 'This station is Weedon.' The predicate must possess some general significance for the person addressed, or the statement would be wasted. A bare 'hoc est illud' is really impossible. To point with the finger to two objects neither of which recalled any idea at all to the person for whose benefit they were being identified, would be meaningless—a page of algebraic equations to a little child not more so.[2] One presentation to consciousness cannot be predicated of another. Individual designations must have acquired some significance. But the question how far proper names are connotative is a large one.

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[1] Hamilton says :—'We think, we conceive, we comprehend, a thing only as we think it as within or under something else; but to do this of the infinite is to think the infinite as finite.' There is here, surely, a confusion of thought. If something is predicated, for instance, of spatial infinity this is to place it within boundaries of thought, but not within boundaries of space. Has the Infinite no attributes?

[2] Or the following, which catches my eye in the law column of an Edinburgh newspaper, to myself :—' Lord —. Act. —. Alt. —. The Lord Ordinary having considered the closed record, proof and productions, repels the claim on the fund *in medio* for the claimants, No. 14 of process: Sustains the claim for the claimants; and ranks and prefers them accordingly in the said fund *in medio* in terms of the condescendence and claims, No. 15 of process : And discerns.'

§ 495. The subject of a universal judgement is less well known and narrower than the predicate, or in other words is nearer to perception and further from conception. If a concept, it is a lower concept. But it may be merely denominative or indicative, without connotation. A lecturer in chemistry may begin : ' I am going to tell you something about this object which I hold in my hand (or these objects which you see on the table), which you do not, perhaps, recognize, and of which, probably, you do not even know the name.' On the other hand, the predicate must be a concept ; must, that is, even when the name of a single object, have some conceptual and general significance. Thus :—

> I am a lord indeed,
> And not a tinker, nor Christophero Sly.

§ 496. The subject is essentially at bottom substantival, even when a grammatical adjective or participle. ' Beati pacifici '— blessed are the peacemakers ; ' seniores priores '—elder persons go first. Neuter plurals often stand as subject—e. g. ' mediocria firma.' And the predicate is essentially adjectival, even when a grammatical substantive ('traditores proditores ' ; ' Tu es capitaine ' ; ' This is food '), or when regarded from the point of view of extension (' Penwipers are useful things ' ; ' She is a widow' ; ' This is a bad business '). In considering the Categories, we shall notice a number of different grammatical forms by which a predicate may be expressed.

§ 497. This adjectival character is less obvious where the ' copula ' unites two abstract qualities—e. g. ' Unity is strength.' What, however, is here predicated of unity is not strength, or the being strong, but identity with strength. Unity in the abstract exists as strength in the abstract. The corresponding proposition about a class is ' The united are strong '.

§ 498. No doubt the thing predicated of a subject is always an attribute—in this case not ' strong ' but ' the being strong'. ' The grapes are sour '—sourness is attributed to the grapes ; grapes possess the attribute of sourness. It follows that the substantive verb usually called the copula is not really a ' mark of attribution '—if so, the subject would come last, not first—but expresses an assertion that what existence or being the subject has it has under a certain adjectival mode or qualification. The grapes have their being (verbal noun) as sour, as being (present

participle) sour.[1] This adjectival mode is usually called in logic, as in grammar, the predicate ; and it is in that sense that we say that the predicate of a proposition is always notional, in other words an adjectival concept, signifying *possessing an attribute.* Whatever is real as X is real as Y. If reality possesses the attribute X-ness it possesses the attribute Y-ness. Propositions *secundi adiacentis*—' sol splendet '; ' Dogs bark '; 'I ran'—may be analysed into the same elements. Sometimes a sentence lies in a single impersonal verb—e. g. σαλπίσει, The trumpet shall sound.[2] On the other hand the original of ' I will put my trust in Him ' is ἐγὼ ἔσομαι πεποιθὼς ἐπ᾽ αὐτῷ. The necessity of logically resolving all propositions into the *tertii adiacentis* form, called by the schoolmen *oratio perfecta*, follows from the doctrine that all predication whatsoever brings a subject under a general notion. See below, § 612.

§ 499. We are now in a position to scrutinize Hamilton's view of the Import of the Proposition.[3] He says, following Locke : ' To judge is to recognize the relation of congruence or of confliction in which two concepts, or two individual things, or a concept and an individual, compared together, stand to each other. This recognition, considered as an act of internal consciousness, is called a Judgement ; considered as expressed in Language it is called a Proposition or Predication.'[4] The congruence or agreement of two ideas Hamilton explains as their capability of being ' connected in thought ', of being com-

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[1] This modal character is especially observable in tertiary predicates— e. g. δεινὰ τἀπιτίμια δαίμων ἔδωκεν, or κάλλιστος ἀνὴρ ὑπὸ ῎Ιλιον ἦλθεν Νιρεύς.

[2] I Cor. xv. 12. σάλπιγξ, however, occurs in the preceding clause. Bosanquet remarks : ' The reason why the Verb is appropriated to the act of predication is that it is a miniature sentence . . . . By convention, or explicitly in the person-ending, it includes within itself a reference to given reality, and can therefore stand alone as an enunciation, which no other part of speech can do' (*Logic*, i. 84). He adds :—' An adjective implies a reference to something else ; but the something may be a mere idea. . . . It is in the demonstrative force of the verb that we must look for its fundamental predicative force.' The copula he calls ' a mere sign of affirmation '.

[3] I have not troubled in this book to keep the names Judgement and Proposition distinct, for it is seldom that the one is not also the other. However, as every judgement is an interpretation of the facts of sense, so every proposition, by which judgement is translated into speech, is an interpretation of an interpretation.

[4] *Lectures on Logic*, i. 225.

bined in the same presentation of sense or representation of imagination. He instances *learning* and *virtue, beauty* and *riches, magnanimity* and *stature.*[1]

§ 500. Congruence and confliction, however, only give us two judgements, the particular affirmative and the universal negative, in which subject and predicate may be transposed. Some learned people are virtuous and some virtuous people are learned. The attributes may go together; they are capable of being combined in the same person. Again, no learned people are lazy and no lazy people are learned. The attributes cannot be combined in the same person. We want a word to indicate that attributes *need not* be combined, which would give us the particular negative judgement—some learned persons are not rich. If, further, it could be implied by any form of thought that attributes *are necessarily* combined, we should have a convertible universal affirmative judgement (the admissibility of which has to be discussed later), as when one of the Apologists says that to Christians every foreign country is a fatherland and every fatherland a foreign country.

§ 501. Where, however, in this scheme is room to be found for the ordinary universal affirmative judgement—'Comparisons are odious'; 'Queen Anne is dead'; 'The learned are always diligent'? Subject and predicate in such judgements do not stand on the same level. The judgements are not convertible. Not all diligent people are learned, nor all dead people are Queen Anne, nor all odious things are comparisons. Yet Hamilton explains *agreeing* or *congruent* as ' coinciding ', ' conceived as one,' capable of being 'blended into one'.[2] But just afterwards he says :—' We may articulately define a judgement or proposition to be the product of that act in which we pronounce that, of two notions, thought as subject and predicate, the one does or does not constitute a part of the other, either in the quantity of Extension or in the quantity of Comprehension.'[3]

§ 502. It is clear, however, that throughout Hamilton's exposition of the import of propositional assertion he is thinking only of the subordination of species to genera in a classified scheme of things, where the higher or including class is always part of the definition of the lower or included class. The

[1] *Lectures on Logic,* i. 213, 214. [2] Ibid. p. 227.
[3] Ibid. p. 229,

predicate, he says, forms one notion with the subject, and is judged to be ' one of the constituent characters of the [subject] notion '. Thus *polar* is part of the notion *electrical.* In other words the Hamiltonian view ignores all judgements except analytical ones. Judgements of experience are not a comparison of notion with notion but a bringing of fact under notion. ' Mary had a little lamb ' is a proposition concerning Mary, not concerning my idea of her. No doubt it is what I know of her which makes me say she had a lamb. But this knowledge is empirical merely. Or take this rustic saying—' Lang and lazy, Black and proud, Vair and voolish, Little and loud.' Long people have been noticed to be lazy, dark people to be proud. Folly has been found to co-exist with fair complexions and loudness with low stature. No doubt a causal connexion is implied. But there is nothing in the *notion* of length which implies laziness, nor will analysis of blackness as an idea show it to contain, as one of its constituents, pride.

§ 503. To find by comparison that two notions agree in some respect is not to form a judgement having the one as subject and the other as predicate. Puppies and calves, *ex vi notionum*, agree in being young, but puppies are not calves nor calves puppies. Yet Jevons speaks of the relation of subject and predicate as ' a relation of sameness or difference ', and Mr. A. Sidgwick contends that ' every proposition asserts the manner in which two nameable things are related to each other ; e.g. as resembling or differing '.[1] It is true that negation is a judgement of disagreement. Even a slight point of difference enables me to say that house sparrows are not hedge sparrows, and that Blenheim spaniels are not King Charlies. But affirmation—e.g. ' A turnip is a root '—is not the statement of a resemblance. If a certain resemblance justifies a judgement, turnips are potatoes, since both are roots. We judge that S is not P on the ground that the one is M and the other is not M ; but we cannot judge that S is P on the ground that both are M.

§ 504. Again, judgement is the result of a comparison between some circumstance or quality known to belong to a thing and a notion ; which circumstance or quality does not conform to the notion in one or more respects only, but in all. Yonder orb is a planet because it moves round the sun—such being the

[1] *Fallacies,* p. 35.

definition of planet. It would not be enough that the circumstance observed of the subject should agree with one of the constituent and essential characters of the predicate notion ; e.g. *visible moving* as implied in *planet*, for comets move visibly. If I say, 'Soap is useful, because it is detergent,' usefulness is part of the notion of detergence, not detergence of usefulness.[1]

A whist-player looks first at the turned-up card, and then goes through his hand to see if any of his cards resemble it, and so are trumps. He could not ascertain this merely by scrutinizing his hand, unless some suit, as clubs, were necessarily trumps. The latter case corresponds to the analytic judgement, in which scrutiny of the subject *idea* enables us to frame a proposition—e.g. that those whom we commend or blame for their actions must be regarded by us as having free will. But in the other case the suits in the player's hand are as yet unrelated to anything until the turned-up card has been glanced at. And so I cannot affirm that sugar fattens until I have on the one hand considered what fattening means, and on the other sifted the facts which I happen to know about sugar. This is the ordinary synthetic judgement.

§ 505. Hegel observes that judgement is the notion particularizing itself, and the predicate fills the subject, regarded as in itself void, with content. His example is, ' God is all-powerful.' If we learn this attribute of God by His acts, the proposition is synthetic. If without all-mightiness we should not think of a Being as truly God, it is analytic.

§ 506. Professor Carveth Read remarks [2] that there are three leading schools of logicians, the Nominalist, the Conceptualist and the Materialist. The first (e.g. Whately) regards Logic as

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[1] It may be objected that 'useful' is no part of the actual notion (=definition) of 'detergent', any more than it is of soap in the rationalized judgement, ' Brown Windsor is useful, because it is soap.' Of course I am arguing against, not for, Hamilton's point of view. But sooner or later, in assigning ground for ground, we must come to an analytic, or at least self-evident, judgement. In other words, every judgement rests ultimately on an identity in difference, one, that is, in which the middle and major terms are found to be identical. If we had gone on : ' What is detergent has the property of making foul linen clean, and whatever does this is *essentially* useful,' we should be on the way, at any rate, to such identification of notions.

[2] *Logic*, p. 10.

concerned with the consistent use of words. The second (e.g. Hamilton) regards it as securing consistency in the relations of thoughts, and as concerned with judgements rather than with propositions. The third (Mill, Bain, Venn, &c.) look to Logic as securing true statements about the relations to one another of facts. Mr. Read does not mention the view which regards judgement as ordinarily asserting a relation not between name and name, nor yet between thought and thought, nor yet between fact and fact, but rather between fact and thought—the bringing of experiences under conceptions.

CHAPTER XV

ANALYTIC OR EXPLICATIVE JUDGEMENTS

§ 507. Examination of the view of predication as notional inclusion has led us to speak of Analytic (Decompositive) as contrasted with Synthetic (Compositive) Judgement. The distinction, already pointed out by Hume and by Locke in discussing 'Identical Propositions', was emphasized by Kant. Analytic Judgements have also been called Explicative, Elucidatory, Immediate,[1] Necessary, Essential, in contrast with Informative, Mediate, Contingent or Accidental Judgements. Nominalist writers distinguish propositions as Verbal and Real.

§ 508. By 'verbal' Locke means not only propositions in which 'the same term, importing the same idea, is affirmed of itself'—e.g. 'A four-post bedstead is a bedstead with four posts'—but 'all propositions which affirm *genera* of *species* are barely verbal '—e.g. 'Lead is a metal', metal being already part of the essential notion of lead.

The expression ' verbal ', however, should clearly be reserved either for propositions which are actually tautologous, where, that is to say, the predicate is simply a repetition, *iisdem verbis*, of the subject—as in Ben Jonson's line, 'A wooden dagger is a dagger of wood '—,or for propositions which explain the meaning of a word—e.g. ' Parsimony is thrift ', ' A mercenary is a soldier who fights for pay ' (' only for pay ', an Englishman, proud of the King's army, would prefer to say) ; ' Pyrotechnics are fireworks.'

§ 509. Locke avers that tautologies of the form 'Whatever is, is', ' Right is right and wrong is wrong,' 'The law is the law,' and the like, are mere 'trifling with words. It is but like a monkey shifting his oyster from one hand to the other ; and, had he but words, might, no doubt, have said, " Oyster in right hand is

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[1] That no judgement can be immediate is maintained throughout this book. To our rudimentary perceptions the name ' judgement ' must be denied.

subject and oyster in left hand is predicate," and so might have made a self-evident proposition of oysters, i.e. oyster is oyster; and yet with all this have not been one whit the wiser or more knowing.'[1]

§ 510. It is strange, if verbally identical propositions are not worth making, that they are so frequently made. 'Man is man,' sings Enid, 'and master of his fate.' 'Son' Io '—'I am I.'[2] We point out that business is business, that boys will be boys, that 'Love is love, in beggars or in kings'. It has been already shown (§ 45) that such tautologies are not worthless truisms, inasmuch as subjects are directly *denominative*, and in danger of being thought merely in extension, as class-names. Predicates, on the other hand, are primarily thought in intension; and the repetition of the subject expression in the predicate calls attention, therefore, to the attributes connoted by the name. τὴν σκάφην σκάφην λέγει. 'Let your yea be yea and your nay nay.' If I say, 'A picture should be a picture,' I mean that it should be pictorial, and not a mere transcript or photograph. 'A man's a man for a' that ', reminds the reader of the humanity of every person, however lowly, who bears the name 'man '. When the patriarch exclaims, 'If I am bereaved of my children I am bereaved,' he has acutely before his imagination the significance of bereavement. Pilate's ὃ γέγραφα γέγραφα insists on the perfect tense. It is finished, and cannot be re-opened; like Dryden's couplet—

Not heaven itself upon the past has power;
But what has been has been, and I have had my hour.

Similarly 'Nous verrons ce que nous verrons' emphasizes the future tense and the impossibility of prediction. The cottage mother's philosophy, on the other hand, about infantile disorders—'If children are going to have things they will have them, and if not they won't '—converts mere futurity into an irreformable decree of Providence. When Tennyson writes, 'No, she never loved you truly; love is love for evermore,' he implies that what goes by that name is not truly love unless it

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[1] *The Human Understanding*, bk. iv, c. viii, § 3. Hegel also maintains that the proposition A is A is necessarily frivolous.

[2] The ineffable Name represented by the Tetragrammaton JHVH is thought to mean, 'I will be that which I will be.'

has the characteristics of true love, such as constancy. Byron
writes—

> To see my name in print—
> A book's a book, although there's nothing in't.

And the line quoted just now from Jonson is seen to convey a
meaning when we add its fellow—

> A wooden dagger is a dagger of wood;
> Nor gold nor ivory haft can make it good.

In 'Gilded chains are chains still' the mind is recalled to a part
of the subject which might be in peril of being obscured by
another element of it.

§ 511. Such propositions are not to be classed with 'Blue-nosed
baboons are baboons with blue noses', or with 'Midsummer-day
is the day in the middle of summer' (contrast 'Midsummer-day
is June 24th'). Judgements in which the predicate is a *mere*
repetition of the subject are not judgements at all. Nothing is
judged. They are only propounded in jest, and then, usually,
under the thin disguise of a verbal change. Schoolboys say, 'I'll
not do it again—till next time.' The Americans are fond of this
form of humour; e.g. 'He was born early in life in the town of
X'; or 'I lay, expecting every moment to be my next'. But
the old nursery rhymes employ it most audaciously—as in the
case of the plaguy old woman unquiet, who lived upon nothing
but victuals and drink; victuals and drink were the whole of her
diet. One rhyme advises us to go to bed early and keep our
feet dry, in which case we shall live till we die; and another
gives John Boldero's counsel to wives and maids, how to make
their candles last for aye. What delightful exemplifications,
too, of absurd truism and seeming verbal contradiction there are
in the famous twelve-line Gammer Gurton about the 'three
children sliding on the ice all on a summer's day'. Compare
what Charmian in *Antony and Cleopatra* says of 'the pretty
worm of Nilus'—'His biting is immortal. Those that do die
of it do seldom or never recover.' On the other hand, 'A great
cause of night is lack of the sun' might convey information to a
troglodyte. The common remark 'I am not so young as I was'
is a truistic reminder of the significance of advancing years.

§ 512. Examples of verbal paradox and seeming contradiction
were given in § 133. But the affirmative tautology, 'If I perish,
I perish,' has not an exact negative counterpart, seeing that we

can significantly affirm, but cannot deny, of any notion its essential content. Propositions such as 'Poverty of spirit is not poor-spiritedness', or ' A sportsman is not a sporting-man ', call attention by a slight verbal variation to a difference in the usage of words. Possibly a word has come to be used quite technically—e.g. ' The Speaker does not speak.' Or we may think it is in danger of becoming conventionalized—' It is the duty of an Opposition to oppose,' not merely to sit on the Speaker's left. ' Conservatives ought to conserve,' not merely to belong to the Carlton Club or the Primrose League. But we could not say, ' He who speaks does not speak,' or ' Those who conserve do not conserve '. ' Liberals '—but not ' Those who are liberal '—' are not liberal.'

' No true disciple of mine,' said Ruskin, ' will ever be a Ruskinian.' The only immortal tongues are the ' dead ' ones—compare, ' Comme ils sont jeunes, ces antiques ! ' A condition of ' crisis ', some one has said, is normal in the Church. All 'improvements ' (e. g. in village architecture) have long been for the worse. There is an art, we say, in being ' natural '. A ' half-truth ' is not half the truth, but ' is ever the blackest of lies '. Free trade in land has often meant land monopoly. The cynic said that the ' equality of the sexes ' is the supremacy of woman ; the humorist that for an impromptu speech he required a fort-night's notice. ' I am their leader,' remarked a statesman bitterly ; ' I must follow them.' A London tailor gave as a reason to a customer for the non-delivery of a suit that his men had gone to walk in the procession of the Unemployed.

Tacitus is fond of epigrammatic paradox, such as the well-known—' praefulgebant Cassius atque Brutus eo ipso quod effigies eorum non visebantur ' [1]—they were conspicuous by their absence. The predicates are clearly used in a separate sense from that of the subjects in the definition of the equal state as that in which everybody is somebody and nobody is anybody. ' Then we are in order,' cries Jack Cade, ' when we are most out of order.' We have all experienced the wisdom of the saying, ' There is no time to-day for short cuts.' Of course poetry constantly challenges our attention to something para-doxical in the expression ; as in Milton's line—

I waked ; she fled ; and day brought back my night,

[1] *Ann.* iii. 76.

or Quarles's verses 'To my heart'—

　　　　Mine wert thou never till thou wert not mine.

Sacred rhetoric especially uses this figure; e. g. Tertullian's—
'quae maior voluptas quam fastidium omnis voluptatis ? '

§ 513. But Locke also includes under 'trifling propositions'
those that are usually called Analytic, which, having a predicate
more extensive than the subject, explicate the content of a name,
not verbally in terms of itself, but by recalling one or more of
its essential characters. These, he maintains, like Identical
Propositions, 'teach us nothing.'

Locke does not mention an intermediate class of propositions,
those which appeal to the etymological meaning of a word
rather than to the conceptual content of a notion. The Stoics
pointed to the derivation of 'virtue' to show that it consists in
manhood. A layman is not simply a non-expert, but one who
has duties and privileges as a member of God's λαός ; but again,
since a λαός is not a δῆμος, those duties and rights are not
necessarily democratic. Towns whose names end in 'mouth'
(e. g. Plymouth) are, we can be sure, or were at some time, sea-
ports, and on a river. Ruskin enlarges on the gulf between
franchise, the quality of the Franks, and the parliamentary
thing.[1] At the equinox there are twelve hours of daylight.
A magpie talks and is coloured black and white. A reason
must be rational. An archdeacon performs archidiaconal
functions. This happens, by the by, not to be true ; though in
England and elsewhere, till about the end of the twelfth century,
an archdeacon was actually chief of the diaconate. But it is
often a real elucidation of a name, and a help towards recovering
its true sense, to throw it into adjectival form, or to substitute
the form it has in the original or some other language. A
mischief-maker is 'diabolical'. An apostle has an apostolic
commission.[2] There is an ethical tinge in 'womanly' and

[1] *Bible of Amiens*, pp. 10, 60.

[2] This will not always do, however ; for of the words 'churchman' and
'ecclesiastic' it is the latter whose meaning has become deflected. The
technical use of 'churchman' (as used, for example, in the Declaration
prefixed to the XXXIX Articles, or in Tennyson's lines to F. D. Maurice) is
now almost obsolete. No doubt, it might be held that an ecclesiastic is a
person in a special relation to the formal assembly called the *ecclesia*, just
as a domestic is not any member of the *domus* but one who has a function
in it. A churchman (in the old-fashioned sense) attends to the church as
a coachman does to the coach.

' womanliness ', and in ' feminine ' (though not in ' female '),
which is absent from ' woman '. A preacher may usefully
remember that he has to be a praedicator, a judge to be judicial,
a worshipper to worship, a servant to render service. If it be
debated whether law is essentially positive or natural, the
etymology of ' law ' (A.-S. laid down) might be pointed to. It is
not much use, however, as a rule, to look to the meaning of
proper names to learn anything about general characteristics—
e. g. Philippi or Philadelphia. And changes of meaning are for
ever slipping in between the same word in subject and predi-
cate ; so that we could not argue that a cowboy, or a postboy, is
a boy, and therefore ought to be at school.

§ 514. Condillac regards propositions containing a verbal
identity as frivolous, but not those in which there is an identity
of ideas, or rather a reminder that one idea is included in
another. Of such analytical judgements, however, Locke main-
tains that they ' add no light to our understandings, and bring
no increase to our knowledge '. But their not adding to the
sum of our knowledge need not imply that they do not illuminate
our minds. Explicative judgements certainly enable us to recall
and appreciate better the knowledge we have already put by in
store. They bring home to our mind, and make subjective,
knowledge which was before only dimly realized, lying, as it
were, outside us, yet within hail. Thus Epictetus writes : ' He
that expecteth nothing cannot be disappointed.' ' The *Saturday
Review*,' we might reflect, ' appears, no doubt, at the end of
every week.'

Many examples of conceptual analysis will be found in the
more argumentative Epistles of the New Testament. Thus St.
Paul, speaking of election, reminds the Roman Christians—
εἰ δὲ χάριτι, οὐκέτι ἐξ ἔργων· ἐπεὶ ἡ χάρις οὐκέτι γίνεται χάρις (xi. 6)—
οὐκέτι is only partly temporal here ; *iam non* in the Vulgate, not
non iam. Again, ' Where no law is, there is no transgression '
(iv. 15 : cf. v. 13). ' To him that worketh the reward is not
reckoned as of grace, but of debt' (iv. 4). ' If children, then
heirs' (viii. 17). So also in the Epistle to the Hebrews—' In
that He saith, A new covenant, He hath made the first old ' (viii.
13). ' Where a testament is, there must also of necessity be the
death of the testator' (ix. 16).[1] Or conceptual implication is

[1] Compare also Heb. ii. 6, 8, 10, 11, 14, 17 ; iii. 3 ; iv. 10, 14 ; v. 1,

denied. 'Because they are Abraham's seed, they are not there-fore all children' (Rom. ix. 7).

§ 515. Of course all argument, and all education, must be at bottom *a priori*—an appeal to common ground as to the meaning of concepts.[1] Sometimes an analytical proposition is meant to startle, yet none the less sets out from an assumed agreement. E. g. ' Civilization is man's natural state ' ; ' Protestantism can be the possession of only one man at a time ' ; ' Every Socialist is a conscious or unconscious Tory ' (contrast, ' Every woman is at heart a Tory '). Sometimes we try to arrest attention by the truistic or affectedly moderate form of a proposition—e. g. ' satis quod sufficit '; 'There's a great deal of human nature in mankind.'

§ 516. All propositions stand for something gained to the mind. But only synthetic propositions convey information. We cannot therefore regard as analytic those propositions which, on the authority of the speaker or of a dictionary, tell us for the first time what a name, not ought to mean but, means. ' A vertebrate creature is one that has a backbone.' ' The Chan-cellor of the Exchequer is the minister who manages the finances of the kingdom.' ' Browne's *Pseudodoxia Epidemica* is his *Vulgar Errours*.' ' Effervescence is fizzing.' ' Essex is the land of the East Saxons.' ' Remuneration,' says Costard ; 'oh, that's the Latin name for three farthings.' To make them analytic, we must understand in propositions a *scilicet*, a ' to be sure '. ' X is necessarily ($\check{\eta}\delta\eta$) Y'; ' X cannot, of course, be Z.' ' Lord ! Then I must be thy lady.' Analytic propositions are always persuasive rather than assertory.

§ 517. Definitions (which Bain and others class as verbal) are either propounded authoritatively, as at the beginning of any science—in which case they give information, and are therefore synthetic.[2] Or they are put forward for acceptance suggestively, and as stimulating reflectiveness.[3] Those defini-

13; vi. 7, 16; vii. 7, 11, 12, 26; viii. 3, 4, 7, 24; x. 4, 18, 29; xi. 1, 14; xiii. 17; Gal. iii. 18; and many other passages.

[1] See Aristotle, *Post. An.* I. i. 1.

[2] ' "A city is a large town possessing a cathedral," ' says Sidgwick, ' is not a thesis set up for proof, but the registration of a postulate in order to let the full extent of our assumption be openly known ' (*Fallacies*, p. 119). Some cities, e. g. Llandaff, St. David's and Ely, are not large towns.

[3] Isaac Barrow, asked by the Bishop's chaplain, Quid est fides ? answered, *Quod non vides.* Quid est spes ? *Magna res.* Quid est

tions which we gradually, by much reflexion, work out for ourselves are the ones which do most to clear our thoughts. If propounded to a person ignorant of Latin, the proposition, 'Three men make (constitute in thought) a triumvirate,' though a definition, would be as synthetic as 'Four people make (constitute in fact) a game of whist'.

·§ 518. Locke, as we have seen, insists that to predicate of a term either the whole or any part of its content is to trifle—e.g. 'All gold is fusible', for fusibility is already comprehended in 'the received signification of gold'. 'Gold is yellow' also. He gives 'A palfrey is a neighing, ambling animal' as another example of triviality! But while in Locke's view it is trifling to say that man has corporeity, sensibility, rationality, risibility, power of movement, to say that man has a notion of God or is liable to be cast into sleep by opium is 'an instructive proposition'. The generic may not seriously be predicated of a species, for it is part of the definition of the species.

Locke's point of view is inconsistently Realist. He assumes first that the definition of everything is fixed and known to everybody—so that everybody knows without being told that a whale is not a fish, nor a bat a bird, and that lead is, while brass is not, a simple metal—; and, secondly, that, a name being once defined, it is trivial to reflect upon and draw out any part of its meaning—e.g. the rational nature of man. Cousin applies the word Identical to propositions 'in which we affirm of a thing what we already know of it'. But we never do this, in the sense that subject and predicate have, prior to the affirmation, exactly the same value and significance to the conscious intelligence. Every judgement is framed for the enrichment or clarifying of our own mind, or another's. Starting like Locke from a presupposition of definite and unchallengeable concepts, Kant also regards 'Gold is a yellow metal' as analytic. But he does not go so far as to call it puerile. Propositions of the kind would not be so common if they were not worth stating. If they do not instruct, they remind, or make something clearer.

§ 519. But it is a paradox to deny the name 'instructive' to reflective and expository judgements, based upon the analysis of a complex notion into its simpler constituents. Take the follow-

caritas ? *Magna raritas.* Only the first of these answers can be called a definition—a superficial one compared with Heb. xi. 1.

ing. 'Freedom of the will being denied, there can be no morality.' 'Immediate inference is a contradiction in terms' (the view advanced in this book). ' " Miracles do not happen." No; for if they did they would not be miracles.' That is, the *raison d'être* of a miracle is to be exceptional and rare. 'Imitation has no place in morals' (Kant means that an act, to have an ethical character, must proceed from some inward principle). According to Philo, to know that God exists is to know Him to be one, perfect, simple, immutable. Or again, reflexion on what is meant by Unity leads to the conclusion that the Oneness of the Godhead does not mean an everlasting loneliness and singleness, but rather an internal consociation and co-operation within a unique Being. Ridley says :—'Commemoratio non est rei praesentis, sed praeteritae et absentis '—to which it has been replied that ἀνάμνησις has not necessarily this connotation. Buonaparte observed that a throne is but boards covered with velvet—though his acts belied this contemptuous analysis.

§ 520. It depends on the way in which a proposition is put forward whether it is, or is not, to be called analytical. It must *claim* that character in order to have it. Even as a judgement in the mind it must be consciously based on the analysis of an idea. And as propounded to another it must appeal to that person's reflectiveness. Yet it might be analytic for the speaker but not for the hearer, to whom it might come as assertion and information. A great deal of lecturing is of this kind. Again, what is self-evident to one mind is not so to another. The content of any idea is relative to men's apprehensions.[1]

§ 521. Again, the content of an idea, or, more strictly, the connotation of a name, varies with circumstances. We amend and modify our conceptions. Definition has no absolute and objective stability. New attributes are taken up into the general notion. Old ones are sometimes discarded. If characteristic

[1] There is no ' scientific frontier' between names. ' The meaning of a word,' remarks Mr. Sidgwick, ' is very much like the " market value " of an article—a matter to be settled between the parties concerned.' In theory words ' postulate definition of outline, whereas as a fact complete definition of outline does not exist in nature' (*Fallacies*, pp. 133, 134). If ' night ' is defined as the hours between sunset and sunrise, then 'When the sun sets, who doth not look for night ? ' is analytic. But in the ' land of the midnight sun ' the expression itself is at variance with that definition.

they come to seem essential to it—that is, either part of the actual definition *per genus et differentiam* or derivable from it, and peculiar and proper to the object.   Locke gives five essential characters of man.   Why only five?

§ 522.   Accordingly, ' what is synthetic to-day may be analytic to-morrow.'   But in saying this, we must not be supposed to assent to the common view that every extension of knowledge passes into the *notion* we have of things.   Thus Sigwart observes :—

' The more perfect the knowledge, and the richer therefore the meaning of words [but ' therefore ' begs the question], the less room there is for syntheses, in which something new is learned. In the end, synthetical judgement would be limited to that sphere which can never be denoted by words—to the particular fact as it is for any one who has not observed it for himself.' [1]

He quotes Schleiermacher as limiting the synthetic judgement proper to the sphere of particular facts, and remarks that the distinction is only relative, because the concept is always in process of being formed ; so that ' Ice melts ' by being enunciated at once becomes an analytic proposition.   Bain takes much the same view,[2] and Thomson also.   Lewes says :—

'Synthetic judgements are only analytic judgements in the making.   A synthetic judgement becomes analytic as soon as its elements are integrated.   Propositions which at first were hypothetical became at last truisms.' [3]

§ 523.   Such a view renders worthless the distinction between analytic and synthetic judgements.   If it be true, no synthetic judgement can be framed mentally more than once ; indeed, on Socrates' obstetrical view that all experience and learning is but recollection, not even once.   The moment any circumstance is ascertained, it is bound up in the bundle of our conception, or recognized as being already there.

§ 524.   But this is the confusion already adverted to between the way we conceive a thing and the circumstances we happen to know about it.   I discover that herrings make good manure. I am informed that English judges are only removable on the petition of Lords and Commons to the Throne.   I find that our cricketers usually get their bats at a certain manufacturer's, and

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[1] *Logic*, i. 114.   [2] *Logic*, Pt. I, p. 70.
                    [3] *Hist. of Phil.* ii. 472, 473.

use balls of a certain weight. Some one suggests to me that toothache is cured by decapitation. I observe that cheating never prospers, or that beggars are liable to get into the hands of the police, or that barristers wear bands. But is it to be supposed that from that moment those items of information form for me part of the connotation of the names herring, English judge, Oxford Eleven, toothache, cheating, beggar, and barrister respectively; part, that is to say, of these concepts, so that without them the designations herring, &c., would cease to be applicable ?[1] St. Austin says : 'Gratia nisi sit gratis, non est gratia.' But would the Archbishop of Canterbury cease to be Archbishop of Canterbury if he were no longer a member of the Board of Trade or of the Council of the British Museum ?

§ 525. A proposition which every one at once recognizes as true need not be analytic. And, on the other hand, there are propositions which rake painfully in the bowels of a conception, and which are likely to win their way to acceptance slowly, if at all, to which we must certainly give the title. An illustration of the former kind is, 'Custom-houses are a drawback to the pleasure of travelling.' Of the latter—'Art is not a transcript of mere "fact"'; or, 'Things are not *true* apart from a per-cipient mind.' An analytic judgement is always an appeal, always *ad hominem.* It assumes a common ground of agree-ment or admission between speaker and hearer. But at the same time it invariably makes a demand, sometimes a severe one, upon the reflective powers. A circumstance may be so familiarly known about an object as to be inseparably associated with it ; yet if it is no part of the *notion* it cannot be appealed to in an analytical judgement. E. g. ' The Guards, as you know,

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[1] Sidgwick, having correctly laid it down that 'an analytical proposition is one which cannot be denied without contradicting the postulated meaning of the name employed as subject', deals, I think, inadequately with Bain's assertion (*Deductive Logic*, p. 70) that 'all newly discovered' properties are real predications on their first announcement, although immediately on being communicated they become verbal'. Sidgwick says that this is 'in one sense, no doubt, perfectly true; but the expres-sion needs to be interpreted with care', seeing that 'as a rule, when using a name, we can only have before us quite a small part of its total meaning' (*Fallacies*, p. 126). Only if every circumstance we chance to be acquainted with about a thing is part of the *meaning* of the word, is Bain right. Possibly he is using ' properties ' in a restricted sense—e. g. it is a property of a pyramid to be the form of greatest stability.

wear bearskins.' Ruskin, on the other hand, analytically insists that the Guards ought not to do police duty in Ireland. Five people out of six would be quite unable to say what a Quaker is essentially, but every one recalls certain peculiarities of speech and dress which nevertheless are no part of the connotation of the name. 'Teetotallers do not drink champagne' is analytic. 'Mahometans do not drink champagne' is not.

§ 526. The confusion between our essential notion of a thing and the list of circumstances we happen to be acquainted with concerning it causes Veitch (among others) to say :—

'Logically all judgements are analytic ; for judgement is an assertion by the person judging of what he knows on the subject spoken of. To the person addressed the judgement may contain a predicate new—a new knowledge. But the person making the judgement speaks analytically, and analytically only ; for he sets forth part of what he knows belongs to the subject spoken of . . . Logically, every predicate is analytic. It is explanatory of what is already conceived in the mind of the subject. It is explicit of the implicit.' [1]

§ 527. Bosanquet holds that 'every judgement is both analytic and synthetic ' ; for 'judgement always involves identity in difference '.[2] His illustration is, 'Caesar crossed the Rubicon.' But to turn over our stock of knowledge about an object and select one fact is not analysis of a concept.[3]

Bradley more truly remarks that 'every judgement is essentially synthetic '. As already shown, analytic judgements amplify our consciousness by drawing attention to something in the subject which has been imperfectly noticed. Even where the expression is tautologous—e. g. 'Such a gratuitous insult was quite undeserved '—the predicate is fuller of explicit content

[1] *Institutes of Logic*, pp. 237, 238, 253.

[2] *Logic*, i. 99.

[3] Sigwart (*Logic*, i. 109, 110) contends that while ' This liquid is sour ' is synthetic, because the liquid has first to be tasted, ' This rose is yellow ' is analytic, because, if asked ' Which rose ? ' I answer, ' The yellow one.' Surely not. The answer would be, ' The one I hold in my hand,' or ' The one in the middle of the bowl '. Bain (*Logic*, Pt. I, p. 67) maintains that ' Homer wrote the *Iliad* ' is a verbal proposition, because we know nothing else about Homer—so that it is as though we said, 'The writer of the *Iliad* wrote the *Iliad*.' But either ' Homer ' is the true predicate—' It was Homer—not a syndicate—that wrote the *Iliad* '; or possibly an ill-informed person, recalling the name ' Homer', might ask, ' What did Homer do ? ' ' Homer wrote the *Iliad*.'

than the subject: in this illustration the meaning of 'gratuitous' was not distinctly before the speaker's mind. As Lewes says, 'All judgement is predication, and all predication is synthesis.'[1] Still, it may be well to keep the name Synthetic for the Kantian sense of propositions which bring the hitherto unknown into relation with the body of ascertained knowledge.

That every judgement is in a true sense synthetic is itself an analytic judgement.

§ 528. Particular propositions truly such—that is, where the attribution is not regarded as unconditionally valid[2]—are necessarily synthetic. For if the predicate were part of the essential notion of the subject it must have been predicable universally. Individual propositions may be quasi-analytic. 'Our giant will want an unusually big bed.' 'The policeman here is sure to keep order.' 'The Primus will of course take the chair.' 'Yonder flagship carries the Admiral.' But identifications are usually synthetic. 'The Prince of Wales is the Heir Apparent.' 'The flagship is the *Bucentaure*.' Non-connotative terms, if any are strictly such, cannot be the subjects of an analytic judgement. But in 'Caesar's wife must be above suspicion' 'Caesar's wife' is tantamount to a common name. Proper names, as shown above (§ 494), are never without some degree of general significance. If Caesar acted otherwise than in a certain way, he would not be Caesar. Men went down before Lancelot's spear at a touch, 'but knowing I am Lancelot.' Juliet asks, 'Wherefore art thou Romeo?'

§ 529. It should be observed that an analytic judgement is not so called because it analyses, but because it is based and grounded on an analysis. To assert, or judge, that a notion contains certain elements is the psychological counterpart of asserting, or judging, that a chemical substance or a landscape contains certain elements. The analysis is pre-supposed and appealed to by the 'analytic' proposition. It lies behind it. This appeal to something acknowledged constitutes the force of the '*scilicet*', 'eo ipso,' '*ἤδη*,' 'naturally,' 'of course,' 'necessarily,' '*ex vi termini*,' or other such phrase, which is either expressed or

[1] *Hist. of Phil.* ii. 474.

[2] In 'One of the players has to sit out', or 'semper aliquid certi proponendum est', or 'Many will always be on the side of right', or 'Some of my friends can invariably be relied on to help me', there is this unconditional validity. See below, §§ 555, 556.

understood in every analytic proposition. Or the assumed basis
of such a proposition is itself predicated of it—e. g. 'That " hope
which is seen is not hope " is implied in the very meaning
of " hope ".' 'That " by civility we are distinguished from brute
beasts led by sensuality " appears from the actual terms them-
selves.' To deny an analytical proposition is to destoy the
conception analysed. Goodness is part of the notion of God.
Then 'If the gods do evil they are no gods '.

§ 530. Psychological analysis, then, has for its subject the
content of a notion or the meaning of a name. It is thus more
abstract than the analytical judgement logically based upon it.
Being a child implies being an heir. All children, then, (of the
kind intended) are heirs ; and if *we* are children (of God) we are
heirs (of God). The subject of an analytical judgement may be
an abstraction—e. g. 'Patriotism has necessarily, to some extent,
a self-regarding motive.' But the appeal is to what is still more
abstract, viz. the connotation of the name 'patriotism', the
resolution of the *idea*. This lies behind any 'analytic' statement
we make about the *thing*. But analysis of the idea, again, may
appeal to a dissection of the *word* (*patria*, one's own country).
Kant remarks that we think the connexion of subject and pre-
dicate in analytical judgements through identity. But the fact
of the identity has to be *given* by a prior analysis.

§ 531. If this be so, it does not seem exact to speak of the
analytical judgement as a reuniting of the elements obtained by
analysis of a concept.[1] To do so, writes Sigwart, 'no way
contradicts the essence of the judgement, which is to be a
σύνθεσις νοημάτων. For the analysis, or decomposition, is only
the *preparation for the act of judgement*, not the act itself; the
work of judgement is to restore union between the elements
which have been thus distinguished.' In the same way Lewes
observes that the concept being shown by psychology to be
a synthetic *integration* of perceptions, 'or their combination into
a whole,' and analysis having *resolved* the concept into its
constituent elements, the analytical judgement is a *redintegration*
of the concept which has been resolved.[2] But what analysis
does is to break up an *idea*—e. g. 'Being a sailor connotes living

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[1] 'Of a presentation,' is Sigwart's expression (*Logic*, i. 104). He is
speaking of so-called immediate judgements.

[2] *Hist. of Phil.* ii. 472.

on the waves '—, whereas the analytical judgement based on it does not reconstitute the idea, but fills up the picture of an *object*—'A sailor, of course, lives on the waves'. The former tells us what a name *implies*. The latter tells us what a thing therefore *is*. The analysis mediates the analytical judgement. It is its logical ground. Thought gives the one. Reason draws the other. Thought explicates the conception. Reason bases on the result the judgement concerning the corresponding thing or things.[1]

§ 532. And so we see once more that not even analytical judgements are 'immediate'. Pure reason can no more say what is in a concept than it can say what is in a comet. The idea that a logician *ought* to know, without being told, what the essential characters of a notion are springs out of the inveterate confusion of Reason and Judgement. If a mind were to be created stored with universal knowledge, still the distinction would remain between propositions as known and propositions as proved. Yet even Mansel asserts that 'analytical judging is formal, synthetical judging is material'.[2] It will be remembered [3] that 'the thinking process is *formal* when the matter

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[1] In dreams, by some mechanism of the brain, a new circumstance often seems to become known to the dreamer by which a preceding complication is set right or puzzle explained. But lock and key were really made together. The explanation must have been latent there in the sub-consciousness before, or in the moment that, the combination which requires solving formed itself in the sleeper's mind, just as the answer to a riddle must precede the question. Thus, what has the semblance of a newly presented fact of experience was really part of the cerebral presupposition. This may seem analogous to the predicate of an analytic judgement being presupposed in the subject. It could not be explicatively enounced unless it were already there. Yet we must not confuse psychic working with rational process. The analytic judgement does not *recall* by an act of memory, but *concludes* on the ground of a previous analysis. It *infers* that, if a characteristic is part of an ideal content, it is actually found in the corresponding objects. Therefore it is logical rather than psychological.

[2] *Lectures and Reviews*, ed. Chandler, 1873, p. 50.

[3] Dean Mansel's words are:—'Formal judging is possible whenever one of the given concepts is contained in the other. If Q contains the attributes OP I can by a law of thought alone determine "All Q is P". The law in this case is the principle of Identity, of which the most general statement is, "Every A is A," or "Every concept is identical with itself".' He goes on :—'Hypothetical and disjunctive judgments are also sometimes analytical, and the result of a formal process. For example—if,

given is sufficient for the completion of the product, without any other addition than what is communicated in the act of thought itself. It is *material* when the *data* are insufficient, and the mind has consequently to go out of the thinking act to obtain additional materials.'[1]   But no analytical judgement is possible unless the concept is given to reason *as already explicated* by a previous analysis, which constitutes its rational ground. It takes the form, not, 'A notion composed of *x*-ness and *y*-ness and *z*-ness involves *z*-ness,' but 'The thing *X*, *because* the notion of it is composed of *x*-ness and *y*-ness and *z*-ness, is *z*'.   The simple

having given the judgments "*A* is *B*", "*C* is *D*," I can form solely by an act of thought without experience the judgment, " If *A* is *B*, *C* is *D*," the process is formal. This I can do when the concepts are *given* as standing in the relation of operating cause and resulting effect.' But either this knowledge of a causal connexion is given in an extraneous and additional experience—which Mansel supposes not to be the case—or it somehow resides in the judgements '*A* is *B*', '*C* is *D*,' which therefore must be given in some such form as '*A* being *B* is always accompanied by *C* being *D*', or '*A* being *B* always causes *C* to be *D*'. But where is the advance in thought from such *data* to the proposition, ' If *A* is *B*, *C* is *D*'?

There can, in truth, be no such thing either as formal judging or material concluding. If a 'conclusion' has been reached by some process outside of, and apart from, the *data*, it has not been, in relation to the *data*, *concluded* at all, though of course it must have been arrived at from *some* premisses. Mansel quotes De Morgan's 'challenge' inference :—

> Every man is an animal.
> Therefore every head of a man is the head of an animal.

Is this reasoning, he asks, material or formal? If material—drawn from our knowledge of the subject matter—what business has it in a work on formal logic? If formal, it can only be reached by supplying what is formally missing. Or, to take another syllogism propounded by De Morgan—

> 18 out of 21 *Y*'s are *X*'s.
> 15 out of 21 *Y*'s are *Z*'s.
> Therefore 12 *Z*'s (qu. 12 at least ?) are *X*'s.

The reasoning here is valid enough. But, Mansel asks, is it valid in consequence of its form or of its matter? He proceeds to fill in the missing steps. I submit, however, that the mere non-enunciation of all the steps of an argument does not make it material. It is 'material' when, the premisses being all given, it is not based upon them. 'Twelve *Z*'s are *X*'s' would be a 'material inference' (so-called) if it were obtained not by reasoning from the *data* but by inspection of the facts—which is like 'demonstrating' a theorem in Euclid by a yard-measure, or getting the result of a sum right by copying it from the Answers.

[1] Op. cit. p. 49.

pronunciation of the subject term cannot by itself justify a judgement.

§ 533. There is a class of 'necessary judgements' in which the subject cannot be conceived as not involving the predicate, yet the impossibility is not a logical consequence of the definition which we have chosen to give to the subject, but is psychological. Such are Kant's 'synthetic judgements *a priori*'—e. g. the axiom that a straight line is the shortest way between two points (unless this be the definition of straight line), or that a figure with three angles has three, and only three sides.   That a triangle is trilateral Locke considers a trifling proposition, like 'Saffron is yellow'; whereas he considers the statement that the external angle of any triangle is larger than either of the opposite internal angles as a 'real truth', since the predicate 'makes no part of the complex idea signified by the name triangle'.   ('Triangle' is usually defined as a three-sided figure.)   Kant rightly gives the name 'synthetic' to all non-defining geometrical, arithmetical and algebraic propositions, whether axiomatic or derived. E. g. 'The circumference of a circle is more than three times the length of the diameter.'   'The figures composing multiples of nine always, when added together, make nine, or a multiple of nine' $(9 \times 70 = 630$; $9 \times 46 = 414$; $9 \times 71 = 639$; &c.). '$(a + b)^2 = a^2 + 2ab + b^2$.'   Such propositions are necessary; but the necessitation is not logical, but psychological, proceeding from those intuitions of Time and Space, those pure Concepts or Categories of the Understanding, which Kant places among the *a priori* conditions of knowledge[1]—occasioned and confirmed, but not originated, by experience.   Such synthetic judgements *a priori* are not, as Hume contends, 'analytical judgements.'

'A body has extension' is analytic.

'A body has attraction' is empirical.

'A body cannot be in two places at the same time' is synthetic *a priori*. (But a 'ubiquitarian' Lutheran might deny this proposition.)

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[1] *A priori* signifies with Kant, not rational deductiveness from cause to effect, but a constructive limitation arising from the constitution of the human mind.   Lewes (who calls mathematical propositions analytic) describes the Kantian distinction of *a priori* and *a posteriori* as 'a logical distinction without psychological validity' (*Hist. of Phil.* ii. 463, 484). It is surely just the opposite.   It expresses a psychic limitation, which is outside the scope of Logic.

§ 534. A class of quasi-analytical propositions are those which contain an *appealing vocative.* ' It is good and joyful, brethren, to dwell in unity.' ' My son, give me thy heart.' ' Men of Israel' would prepare a Hebrew audience, and 'Quirites' a Roman one, for patriotic exhortation, of which the vocative clause is the ground. So again, 'Britons, strike home.' (It should be noted that the grammatical imperative is logically a proposition—*jubeo, fas est ut, oportet, debes, -ndum est,* or the like, being understood.)

CHAPTER XVI

GENERAL AND CONCRETE PROPOSITIONS

§ 535. Synthetic judgements are either general ('Salt is good') or concrete ('The grapes are sour').

If analytic judgements are those in which something is predicated of a subject on the ground of a psychological analysis of its *idea* (e. g. 'All planets move'), General or Abstract Judgements are those in which something is predicated of a subject on the ground of an empirical analysis of its *nature* (e. g. 'All planets move elliptically'). A connexion of cause, rule, or principle is understood—e. g. 'The noblest mind the best contentment has.' 'A merry heart goes all the way.' 'Χαλεπὰ τὰ καλά.' 'Securus iudicat orbis terrarum.' 'Il faut souffrir pour être belle.' 'Toute civilisation est d'origine aristocratique.' 'Truth never goeth without a scratched face.'

§ 536. In a Concrete Judgement the ground of the predication does not reside in the subject-term,[1] but in the contingent circumstances of the particular objects which are for the moment being spoken of. 'All planets (i. e. all the known planets) move from west to east.' Again, all brooms sweep ; but only some brooms, or this broom, or all the brooms in a particular place, sweep clean—by reason, namely, of something in their nature, such as newness. If this characteristic be added, we get a general proposition—all new brooms sweep clean.[2]

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[1] In 'Some neglected infants die' 'neglected' is part of the cause of death, but not the entire cause. For in that case all neglected infants would die. If the contributory cause, 'because they are weakly,' be expressed, a general judgement is at once suggested—'All neglected infants which are weakly die.'

[2] Sidgwick considers that 'every proposition may be viewed as saying that one thing *indicates*, or does *not indicate*, a certain other'—whether implication be intended (analytical judgement), or the circumstance that one fact is material evidence for another (synthetic). As, however, under the latter head 'indication' (symbolized by →) has to cover assertion both of law and fact (abstract and concrete propositions), he admits

§ 537. The ground of a general proposition may be indicated expressly in the subject. 'The hireling fleeth because he is an hireling.' Or some element of the subject suggests it—'A rolling stone gathers no moss'—because it rolls, and rolling things gather nothing. 'The early bird finds the worm'—because it is early, and what is early finds what is about. A major premiss is appealed to in the background. The general proposition here unfolds into the syllogism without going outside the statement for a middle term. All BA's are C because B's are C (and every BA, of course, is B).

§ 538. But more often the middle term must be sought, inductively or otherwise, outside the proposition. 'Blessed are the meek.' Why? 'For they shall inherit the earth.' All A's are C, because they are B, and every B is C.

§ 539. An epithetical, equally with a determining, element in a subject will often indicate the ground of predication—e. g. 'Royal Windsor has great historic interest'; 'Mortal men should prepare for eternity'; 'Uncertain riches are not to be desired.' But the ground, being assumed, runs the risk of *petitio principii.*

Sometimes the connexion of thought is adversative. 'Threatened men live long'; 'Mortal man recks little of eternity'; 'The daughter of a hundred earls, you are not one to be desired'; 'Great kings love tarts like other folk' (Elia); 'The cobbler's wife goes worst shod'; 'Hard words break no bones'; 'The wicked flee when no man pursueth.' In such propositions one element of the subject often supplies the ground, and another element the adversation. Thus, 'Faithful are the wounds of a friend'; 'Blind Love will find out the way.' All BA's are C because they are A, and in spite of their being B. But

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a 'certain harshness', and that to find 'indicates' in 'Bavius is a fool' is clumsy. Yet he holds that 'no word appears better suited for the purpose' (*Fallacies*, pp. 59–61). But in most concrete propositions there is nothing whatever in the subject to indicate that the predicate is to be expected, for an indication must refer to some law or general connexion behind it. Sidgwick himself says that in a concrete proposition the subject does not indicate the predicate 'except by virtue of the *special circumstances* bound up with the thing most prominently denoted there as subject' (ibid.). Besides, it is more natural to regard predicates as indicating subjects (*ratio cognoscendi*). E. g. 'A bad workman blames his tools.'

in a negative adversation the subject is often a single word—
e. g. 'Compliments butter no parsnips.'

§ 540. In such a proposition as the famous 'canis vivus
melior est leone mortuo' (Elizabeth was the former and Mary
the latter) the ground is indicated in subject and predicate
together; and there is also an 'albeit' in both.   A live dog,
because alive and though a dog, is better than a dead lion,
because dead and though a lion.

§ 541. It will be observed that every general proposition
involves an *if* and also a *because*.   'Every X is Y' means that
if anything is X then, *because* it is X, it is Y.   'A burnt child
fears the fire' is equivalent to 'If a child has been burnt, then
for that reason it fears the fire'.   But the 'for that reason' may
need a good deal of further explicating.   Thus, the proposition
'Months without an "r" in them are not good for eating water-
cress playfully suggests a causal connexion, though the unfitness
of the months May to August for the purpose has nothing to do
with spelling.

§ 542. 'Causal connexion' must be taken as covering every
kind of universal relation between subject and predicate involving
a rule, principle or generalization.   Logic is only concerned
with subjects and predicates, in the two relations of general
statement and concrete fact.   To the metaphysician 'A green
Yule makes a fat churchyard' is the same statement as 'A fat
churchyard is caused by a green Yule'.   But the logician looks
to the form of the predication.

§ 543. He is not concerned therefore with the distinctions—
often difficult to discriminate—in the relation of predicate to
subject which underlie the verbal expression.[1]   This, as we
saw above (§ 218), sometimes expresses a sign ('Creaking boots
have not been paid for'), but more often one of the following
ontological relations :—

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[1] De Morgan (*Formal Logic*, p. 49) observes that the Copula is used
in different senses according as names, ideas, or objects are intended.
(a) 'Man is animal.'   The name 'animal' can be applied to whatever
objects 'man' can be applied to.   (β) 'Is' signifies the possession of
constitutive characteristics ('Three are a quorum'?).   (γ) 'Is' signifies
identity with an external object.   'Man *is* one of the animals.'   Touch
him and you touch an animal.   We identify the objects, but not the
names or the ideas.   These distinctions, however, are superficial and of
no logical value.

Condition. The righteous shall be rewarded.

Possession of attribute. Porcelain is brittle.

Class-reference. A lion is a large cat.

Activity. Evil pursueth sinners.   Water finds its own level.

Character. The raven chides blackness.

Production of effect.   The good are happy (simultaneous). Fire melts wax (gradual).

Equation. $6x$ is $9y$.

Identification. Maro is Virgil. $\sqrt{16}$ is 4.

Definition. Dirt is matter out of place.

§ 544. The above relations, except the first and last, belong also to Concrete Propositions, in the form, however, of mere empirical antecedence and accidental fact. 'The fire is out'; 'Three men are at the door'; 'Some people can eat meat un-cooked.' But in 'The blind man fell into the ditch' a narrative judgement indicates a cause. 'Existential' judgements are usually concrete, but not always—e. g. 'In much wisdom is much grief' (Eccl. i. 18).

§ 545. Regarded from the point of view not of the subject, but of the predicate, the significance of predication may be described as class-inclusion, genus, difference, attribution, inherence, quality, concomitance, co-existence, effect, consequence, sign, &c.

McCosh remarks :—

'The logician does not require to consider what is the nature of the dependence of the consequent on the antecedent, whether it is in things or in thought, whether it is or is not the relation of cause and effect, or whether the relation of cause and effect is necessary or contingent. He leaves all these questions to the investigator or the metaphysician. To him the relation of the two [propositions] is given, and he has to consider the discursive thought involved in the relation.'[1]

§ 546. The propositions here spoken of are the antecedent and consequent in a Hypothetical Judgement. If A is B, it is C. Or, if A is B, C is D. But, as will be shown, the ordinary categorical judgement, if general, is essentially hypothetical. 'Every BA is C'; i. e. If any A is B, it is C—, and for 'the two propositions' we can substitute 'the two terms'. Logic does not go into ontological questions. It is satisfied with the state-ment that given, or assuming, an antecedent condition, a certain

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[1] *Laws of Discursive Thought*, p. 107.

consequence will hold good. The 'hypothetical or abstract affirmation of necessary connexions' (Bosanquet) is the universal judgement. At bottom a categorical general proposition like 'Every bullet has its billet' is analogous to—

> If Candlemas Day be fine and fair,
> Ye've half the winter to come and mair.[1]

'Who sleeps dines' is equivalent to 'If any one sleeps, he dines'.

§ 547. If any philosophic distinction is to be drawn between a categorical general proposition and a hypothetical, it must be by reserving the latter name for the subjunctive mood in the past tense, suggesting the improbability of the condition being realized. 'If all the sea were ink, and all the trees were bread and cheese, what should we do for drink?' But even so, the distinction is only on the surface. 'If any A were B it would be C' can be expressed in the form, 'Every BA would be C.'

'The north wind brings snow' is general. 'The north wind doth blow' is concrete. The former proposition expands thus— If the wind be a north one (blow from the north) we shall have snow. Supply now the minor premiss, 'The north wind doth blow,' and the conclusion follows, 'We shall have snow.' As regards a judgement like this, 'All living things are now asleep,' we notice that what is asserted is a concrete circumstance, and yet the judgement has not been arrived at perceptively, by enumeration, but as a deduction from an abstract judgement. 'All living things sleep at midnight. This is midnight. Then all living things sleep now'. But 'sleep' here is not concrete, 'are sleeping,' but abstract, 'are of a kind to sleep,' 'may be expected to sleep.' From this conclusion we get, by the *ratio essendi,* 'All living things, then, are now asleep.'

§ 548. Conversely, every hypothetical proposition is a general one. The same is the case where there is an antecedent clause introduced by *when, where, as often as,* or similar conjunctions. 'Ubi amor, ibi Trinitas'; 'Where the bee sucks, there lurk I'; 'When the age is in, the wit is out'; 'While there is life there is hope'; 'When the cat's away, the mice do play'; 'Wherever we tap organic nature, it seems to flow with purpose'

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[1] Si sol splendescat, Maria purificante,
Maior erit glacies post festum quam fuit ante.

(Romanes). The form 'No X is Y' is illustrated by 'It is not night when I do see your face'. Such conjunctions do not lose their local and temporal significance—e. g. 'dum spiro spero'—; but, says Sigwart, 'we cannot state that two events will happen together in the future, or that they will always and unconditionally take place together, unless there be some necessary connexion between them.'[1]

§ 549. A general proposition imports that in every case where the antecedent condition exists the consequent is found. But many general assertions seem to have a quantification which is less than universal. The following are some examples (see also below, § 581) :—

Half a loaf is better than no bread.

One swallow does not make spring.

Multi homines unus populus.

No two minds think alike.

Ten to one is no impeachment of valour.

Three generations make a gentleman.

Three removes are worse than a fire.

Fifteen millions of people must give way to forty (Napoleon).

Two of a trade never agree.

À corsaire corsaire et demi.

One half the world does not know how the other half lives.

Two's company, three's none.

Two blacks do not make a white.

Much cry, little wool.

A little leaven leaveneth the lump.

One soul outweighs the world.

Two straight lines cannot enclose a space.

Duobus litigantibus, gaudet tertius.

Ten thousand difficulties do not make one doubt.

A thousand years in Thy sight are as one day.

Better fifty years of Europe than a cycle of Cathay.

Much study is a weariness of the flesh.

If the last example meant that a great deal of study is a weariness, but not all, it would be a particular judgement. It would be particular if 'Many waters cannot quench love' meant that a large proportion cannot, but others can. Cf. 'Much rain wears the marble'. 'Of making many books there

[1] *Logic*, i. 218.

is no end', in like manner. Equally 'Nine tailors make a man' would be particular if the meaning were that of all tailors only nine succeed in making a man. 'Too many cooks spoil the broth' would be particular if the words signified that more cooks than we could wish spoil the broth. Or 'A little learning is a dangerous thing' if it were meant that all the rest is not so.

§ 550. In the above propositions, the numerical or quantitative expressions do not quantify the judgement, but are themselves a qualifying and hypothetical part of the subject. E. g. ' Five sparrows are sold for two farthings' is equivalent to ' *Whenever* five sparrows are sold they are sold for two farthings.' Compare 'ubi tres ibi Ecclesia'. ' If tailors be nine they make a man': contrast ' Nine tailors are out of work '. ' Much,' 'five,' ' nine,' and the like, are here *collective*, not distributive. ' Unus homo nullus homo' is equivalent to 'Every case of *unus homo* is a case of *nullus homo*'. ' Many hands make light work ' is not a plural but a singular proposition—'many' being collective, as in ' Many a little makes a mickle'. 'Where there are many hands they make light work.' Similarly, 'One fool makes many,' or ' Half a truth is ever the blackest of lies'. ' The many fail, the one succeeds ' may be regarded either as antecedent and consequent—' Where the many fail the one succeeds '—or as two particular propositions, either of which, however, is a generalization. ('Cf. 'A few pray ever, many not at all '.) ' They that run in a race run all, but one receiveth the prize ' is, taken as an entire proposition, general (πάντες μὲν . . εἷς δέ). But of the clauses taken separately, the former is universal, the latter particular.

§ 551. General propositions may be expressed in thousands of different forms. A variety of examples is given in Appendix K. The word 'all' itself introduces a number of universal relations. Thus—

1. All the rocks are dangerous.
2. All the rocks are now submerged by the tide.
3. All rocks are fragments (rocks are always fragments).
4. The rock is all porous.
5. The rock is always slippery.

1 and 2 are concrete universals ;[1] but in the former case a

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[1] It should be noticed that Aristotle seems to use the word 'universal' of abstract judgements only, where there is an essential connexion between

permanent quality, in the latter a temporary circumstance, is predicated. 4 and 5 also have a concrete subject; but in 4 a unity of continuous parts is asserted of it, in 5 a unity running through successive moments. 3 alone is a general proposition of the normal type. ' All ' is collective in Byron's lines :—

> All that tread
> The globe are but a handful to the tribes
> That slumber in its bosom.

But 'totus mundus stultizat' (Francis II to the Hungarian Diet), like the French 'Tout le monde s'amuse', has a distributive sense. 'All the world's a stage' is best classed as collective. Equally 'All the men were about twelve' (Acts xix).

§ 552. A single point of time must be concrete. Yet the proposition may contain an abstract and general element. E. g. 'All the children in France are at this moment learning geography.' Marks of time may be recurrent. 'May 29th is Oak-apple Day'; 'July 2nd is the day my brother died.' 'July 2nd, 1866' would be merely narrative.

§ 553. The more or less of abstract character attaching to the subject of a proposition, and determining the proposition as abstract or concrete, need not appear in the expression. We can say, 'A wet June puts all in tune,' or 'A wet June spoilt the hay-crop last year'. 'A' signifies one of a class. The definite article often expresses a type. We can say, 'The lion is the king of beasts,' or 'The lion inhabited Palestine in David's time'. Take next an 'abstract' notion.[1] 'Procrastination is the thief of time' (general). 'Procrastination lost him his one chance' (concrete). Infinitives and verbal nouns are abstract. But we can equally well say, 'Their strength is to sit still,' or 'Their

subject and predicate. Καθόλου δὲ λέγω ὃ ἂν κατὰ παντός τε ὑπάρχῃ καὶ καθ' αὐτὸ καὶ ᾗ αὐτό (*An. Post.* 73 b, 26). See also Sigwart, *Logic*, i. 175. Sigwart observes : 'The statement that it is false that all men are sinners (in the sense of sinfulness inherent in their nature) does not tell us that some men are actually not sinners ; and the empirical judgement " All men are sinners" might still be true, "because all have sinned"' (p. 174).

[1] It is not the 'abstract' name which makes the abstract judgement. As Sidgwick points out (*Use of Words*, p. 254), the distinction between abstract and concrete refers to judgements only, and not properly to names apart from their context in predication. Yet we can hardly avoid giving the name abstraction to the mental process which obtains the idea of blueness from blue objects, of untidiness or punctuality from untidy or punctual people. 'Angle, angular, angularity' is the order of abstraction.

strength was to sit still'; 'Seeing is believing,' or 'Seeing was believing'; 'Writing makes an exact man,' or 'Writing made him an exact man '.   The line 'solamen miseris socios habuisse doloris' makes equally good sense whether we understand 'est' or 'fuit'.

§ 554. Particular expressions like *sometimes, often* or *seldom,* do not destroy the general and abstract character of a proposition if the *quotiens,* instead of quantifying it, is made part of the predicate.[1]   E. g. 'All children are occasionally troublesome'; 'dormit aliquando, numquam moritur, ius'; 'nemo mortalium omnibus horis sapit'; 'Every good servant does not all commands' (*Cymbeline*); 'interdum stultus bene loquitur'; 'Great poets sometimes nod.'   But this, said of any individual poet,— ' aliquando bonus dormitat Homerus'—would be more naturally regarded as particular.   ' The wicked sometimes die repentant' must be particular ; for no one dies more than once.   So also, ' Second thoughts are not always best,' or ' Misfortunes seldom come singly '.

§ 555. And yet these particular judgements are in a sense generalizations—like Escalio's 'Some rise by sin, and some by virtue fall'; or 'Time pleases some, tries all'; or 'One man holding truth, A million fail, confounding oath on oath'; or ' Souvent un beau désordre est un effet de l'art'.   I can reflect on them, and apply them to this or that case.   If it be an observed truth that the wicked sometimes die penitent, then this case of a wicked man dying may be such a case.   I can apply the generalized possibility to the minor term before me, and conclude that the possibility, the chance, attaches to it.   Again, long experience has taught that 'there's something comes to us in life, but more is taken quite away'—in form, a pair of particular judgements.   But I apply the aphorism as a guiding principle to my own career.   ' Some innocents scape not the thunderbolt ' is said, in *Antony and Cleopatra*, with reference to an immediate occasion.   Compare, ' Many are called, but few chosen.'   The universal and its constituent particulars are combined in Euripides' lines—

πᾶς τις αὐτὸν τοῦ πέλας μᾶλλον φιλεῖ,
οἱ μὲν δικαίως, οἱ δὲ καὶ κέρδους χάριν.

[1] It may, in fact, become in the predicate a qualifying adjective ; e.g. ' rarus venit in cenacula miles '; ' deorum est cultor infrequens.'

§ 556. Particular propositions may often be regarded as the result of an induction. For though there can be no causal relation between the predicate and the particular subject, as stated, yet the latter may be understood to answer to a whole nameable class of things. Thus, 'Some rational beings are mortal' is a generalization, if 'some' means a certain understood class, viz., all men.[1] We can subsume under a formally particular judgement, either, as suggested above, by throwing the occasionalness into the predicate, or else by regarding the proposition as itself predicated of the implied sphere of the subject term. Thus—'Eleven of the twenty-two players in a game of cricket field while two are batting.' This becomes a general proposition in the form—'In every game of cricket it is the case that eleven,' &c. Minor premiss—'This is a game of cricket.' Similarly, 'All the rowers in a coxswainless four must be good watermen' is a concrete universal as it stands—though to each of the four rowers there attaches a general obligation—; but expressed thus, 'In every coxswainless four all the rowers,' &c., it is abstract. 'Some are born to greatness' may be stated thus : 'It is always found that some,' &c., or, 'It is found of mankind generally that some,' &c.

§ 557. The essence of a general judgement is invariableness in the bond between antecedent and consequent. Where the former is found the latter will be found. Accordingly, 'Tout comprendre c'est tout pardonner' is not a whit more universal for the word *tout*, for which any other quantity might be substituted—half, a little, nothing. So in the proposition, 'Whether one member suffer all the members suffer with it ; now ye are the Body of Christ and members in particular,' the universality of the first clause does not lie in 'all' but in the asserted connexion. The latter clauses are also general, in spite of the

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[1] Every generic statement may be represented, with reference to a higher genus, as specific and particular; e. g. 'All negroes are woolly-haired' tells us that some men are so. But the converse does not follow, that every particular proposition may be replaced by an inferior general one, or, in other words, that every 'some' stands for a nameable species or group. Thus, some European nations are Roman Catholic, viz. the Latin ones (though this is not quite exhaustive), and here a causal connexion is suggested. But the some European nations who are Calvinistic do not form any racial group, and the statement is purely enumerative and accidental. For an effect is not always traceable to a single cause, but may have different causes in different cases.

phrase 'in particular'.   Also 'The members of that one Body, being many, are one Body', in spite of 'many' in the subject, and 'one' in the predicate.   The proposition is collective.   We have seen that there is the same assertion of invariable connexion in seemingly numerical judgements like 'Where two fires meet they do consume', or 'ubi tres medici duo athei.'   'If two of you shall agree, &c.'

§ 558. A general statement is sometimes an appeal to past experience.   Thus—

Men were deceivers ever.

Nemo repente fuit turpissimus.

Your chestnut was ever the only colour.

Fear and Savoy have never met.

Who ever loved that loved not at first sight?

Jamais Breton ne fit trahison.

Nature did never betray the heart that loved her.

§ 559. A law or rule can often be expressed by an imperative and indicative, or by two imperatives, with or without *and* between them.

Vive pius, moriere (Ovid; be good and you will die all the same).

Laugh and grow fat.

Give a dog a bad name and hang him.

Go a borrowing, go a sorrowing.

Love me, love my dog.

Speak truth and shame the devil.

Give him an inch and he will take an ell.

Lege, lege; aliquid haerebit.

Or by a simple imperative, the condition lying in the verb itself—e. g. 'Take care of the pence' (if of anything); 'ut migraturus habita': if you make your dwelling make it as one who must quit it—or in some other part of the sentence; e. g. τὰ τῶν θεῶν χρὴ φέρειν; 'tota vita discendum est vivere' (Seneca). 'Principiis obsta' may be expanded either thus—If you are making a stand make it at the outset; or thus—If you find mischief being hatched crush it.

§ 560. Since generalization is essentially predictive, such a proposition is often stated in terms of futurity—e. g. 'A friend will be proved in adversity'; 'Wonders will never cease'; 'Care will kill a cat'; 'Murder will out'; 'A lover's eyes will gaze an eagle blind.'   'Dead men tell no tales' may be expli-

cated as 'If a man is dead he tells no tales', or 'he will tell no tales'. Similarly 'Least said, soonest mended.'

§ 561. A general proposition may be in reciprocative form—

Les esprits forts se rencontrent.

Iron sharpeneth iron.

Sensationalism and nominalism always go together.

A fool and his money are soon parted.

Friends have all things in common.

Subsumption of a minor is not always easy in such cases—e. g. after 'Great minds think alike', we cannot go on, 'His is a great mind; therefore it thinks alike'—rather, it thinks like other great minds. A complex minor is wanted for St. Augustine's 'non aliunde beata civitas aliunde homo'.

§ 562. From what has been already said it will be plain that, while the distinction between abstract (or general) and concrete judgements is most important—the one implying a *de iure* connexion of principle, the other only a *de facto* and accidental conjunction of experience—it is not always easy to draw in practice. For, in the first place, no statement can be purely concrete—even 'The clock struck one' or 'Against the Capitol I met a lion' asserts something which, being once true, remains true in and through the variety of all future experiences [1]; the assertion moreover must be based on some intellectual ground, and this is necessarily universal. And, secondly, while each member of a class spoken of generally may be affirmed to do or suffer something once and only once (e. g. 'The world woke one morning to find itself Arian'), on the other hand a particular or concrete subject may have a general predication—e. g. 'Some generals are always fortunate,' 'None of my sons ever tells a lie.' Such propositions are an enumeration of separate generalizations.

§ 563. Still, there is a clear distinction between 'Guineas are yellow' and 'This guinea is light'; between 'Two men form

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[1] A singular subject, even when associated with a mark of time, is an identity persisting through differences. As Dr. Bosanquet says, in a perceptive and narrative judgement like 'Caesar crossed the Rubicon' we are referring to a subject known to us not simply as at a particular moment fording that river, but as the conqueror of Gaul, the rival of Pompey and the true founder of the Roman monarchy. Otherwise the mention of his name would be meaningless, and the proposition an identical one.

a duumvirate [1], and 'Two men formed a duumvirate'; between
'All fat melts with heat' and 'All the fat is in the fire'; between
'All the brothers of our family go into the army' and 'All my
brothers are in the army'; between 'Brutus is an honourable
man' and 'Brutus helped to kill Caesar'.

Clearly, 'I shall die rich' is less a generalization than Pascal's
'Je mourrai seul' (a better reading, however, is 'On mourra
seul'). 'Les Juifs subsistent toujours' is more ambiguous. Is
it a fact or a law? [1] 'Is there corn in Egypt?' was in Jacob's
mouth a concrete question. 'Is there no balm in Gilead?'
implied that it was to be expected there. When Buonaparte
said, 'Every soldier carries a marshal's bâton in his knapsack,'
he said it generally. But 'Every soldier is carrying a wounded
comrade' would be concrete. 'Every soldier is carrying so
many pounds' might be either, according as it were arrived at
enumeratively, or as an inference from some regulation of the
drill-book. 'No general is over seventy' might be said after
scanning the Army List, or else through acquaintance with a
rule about superannuation. 'The rain it raineth every day' is
perceptive. 'In Scotland it rains every day' might be a grum-
bling generalization. 'The British Empire is never at peace'
suggests a causal connexion. But Lord Palmerston's 'I never
could make out where the British Empire is not' was an
enumeration.

§ 564. In English, as an analytic language, it is often easier
to distinguish general from concrete judgements than in more
synthetic tongues. 'Canes latrant,' e. g., has to stand for 'Dogs
bark' and for 'The dogs are barking'. 'Squalent abductis arva
colonis' might mean either 'If the husbandmen are taken away
fields get foul,' or, 'Because the husbandmen have been taken
away the fields are getting foul.' On the other hand, in the
past tense, the auxiliary verb in English, by spreading out the

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[1] 'All great auks are now extinct.' Is this general or concrete? 'All
auks' is in a sense enumerative—though negatively; for we have not
counted the extinct auks, but only know they are extinct by never finding
one—since the class of auks, by the force of the judgement, is limited to
the auks which have actually existed. There can be no more. On the other
hand, we are saying something generally about auks, that auk-existence
is at an end. We are not saying that the auks which empirically have
existed are dead; but that it is impossible that *any* auks should be found
by us again.

action *ante* and *post*, may give a rather more general character to a statement than a bare aorist. Compare 'The wind blew keen' and 'The wind was blowing from the east'. There is no frequentative aorist in English.

§ 565. It should be observed that, while a point of space has continuance in time before and after, a point of time has continuance in space in all directions. Both, therefore, admit of abstract predication. Always, at this place, such a thing happens. Everywhere, at this moment, such a thing exists. 'The Jungfrau is always hard to climb.' 'To-day is a general holiday.'

CHAPTER XVII

QUANTIFICATION

§ 566. THE foregoing discussion of General and Concrete Judgements brings us to a further elucidation of the Quantity and Quality of Propositions.

For purposes of inference, the logician has not only to ask whether the subject of the proposed major premiss is quantitatively *definite* or *indefinite*, but whether, as quantified, it is a specified class or object. For 'twenty-six' is a definite quantity, while 'some' or 'a few' is indefinite (ἀδιόριστος). But 'Twenty-six children are ill' can no more stand as a major premiss (except in equational or 'ultra-dimidiate' reasonings— (discussed below) than 'A few children are ill' can. What reason demands is a universal, a statement, that is, about *all* of a sphere or denomination, whether the circumscription of that sphere be in itself determined or not. It may be an unlimited class, or a class whose limit is known, or even a known individual—all children, all the children, the ten children, both children, this child, John. Such statements can stand as a major premiss, and admit the subsumption of a minor term, which has to be *brought under*, or *identified with*, the middle term.

Take the following inference. 'I won both my games of chess ; one was against X ; I therefore beat X.' Or this, 'Either Y or Z will be the new dean. Y is my oldest friend and Z is my cousin. It follows that either my oldest friend or a cousin of mine will be the dean.' Here 'both my games of chess' and 'Either Y or Z' are expressions relating to all the members of a class limited to two. The latter, or disjunctive expression, will be considered later.

§ 567. Hamilton's Classification of mental Judgements[1] in respect of quantity may be exhibited thus :—

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[1] *Lectures on Logic*, i. 243–5 ; ii. 278.

(1) Definite, or Determinate (of circumscribed sphere)	Of a whole undivided (universal or general propositions)	
	Of a unit indivisible (individual or singular propositions)	A single object (Catiline)
		A collection of single objects (the Twelve Apostles)

(2) Indefinite, or Indeterminate (of uncircumscribed sphere) } = Particular Propositions.

But he overlooks the case of numerical (including singular) particular judgements, which cannot be called indefinite as regards quantity.[1]

§ 568. I suggest the scheme of Judgements according to Quantity which is given on the following page. In that scheme I have used the word 'total' rather than 'aggregate', because (as Bosanquet points out, *Logic*, i. 225) an unknown or unlimited aggregate is a contradiction in terms. By an undetermined total I mean that we can predicate about all men, some men, five men, some man, without knowing how many men exist. On the other hand, the expressions all the men, all nine men, some of the men, five of the men, five of the nine men, Clearchus, all imply a definitely determined extension. The class might be further specified, e.g., 'three of the Seven Sleepers of Ephesus.' 'Every' stands ambiguously for 'all' (abstract), or for 'all the' (concrete).

§ 569. A minor term can be subsumed under the subject of (*A*) propositions or identified with the subject of a (*B*) proposition. In other words, the propositions which fall under (*A*) or (*B*) can be

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[1] 'The whole distinction consists in this, that in Universal and in Individual Judgements the number of the objects judged is thought by us as definite, whereas in Particular Judgements the number of such objects is thought by us as indefinite' (*Lectures on Logic*, i. 246). 'Indefinite' has further to be distinguished from 'Pre-indesignate', by which name 'Pre-indesignate' Hamilton merely intends an accident of expression—e.g. 'Fools mock at sin'; 'Scotsmen take snuff'. In the *Prior Analytics* Judgements are divided into Universal, Particular, and Indefinite. Mr. Stock (*Logic*, § 49) has revived this distinction. It seems, however, unnecessary to take account in a classification of Judgements of those whose quantity is undetermined, or which are expressed elliptically. We need not know how many 'all' or 'some' represents, but we must be told whether a judgement is universal or particular.

A. Universal
- With relation to an undetermined total (*Abstract or General Universals*)
  All *men* (πάντες).
- With relation to a determined total (*Concrete Universals*)
  All *the men* (οἱ πάντες); all *the nine men*; both *men* (tous *les* deux).

B. Individual or Collective
This or that *man*; this or that one of *the nine men*, of *the two men*; Clearchus; the College.

C. Particular
- With relation to an undetermined total
  - Indefinitely quantified — Some *men*; certain *men* (τινές).
  - Definitely quantified — { Plural: Five *men*; two *men*. Singular: A *man* (τις); One Clearchus.
  - Quasi-definitely quantified — Most *men*; many *men*; a few *men*.
- With relation to a determined total
  - Indefinitely quantified — Some, certain, of *the men*, of *the nine men*.
  - Definitely quantified — { Plural: Five of *the men*, of *the nine men*. Singular: One of *the men*, of *the nine men*.
  - Quasi-definitely quantified — Most, many, a few, one or two, of *the men*, of *the nine men*.

used as major premises, but not those which fall under (C) [1], except as explained above (e. g. §§ 555, 556).

The usual triple division of propositions into universal, particular and singular, evidently needs further elucidation.

§ 570. *All, every*, in a general proposition, signifies not only complete distribution, but an ideal boundlessness of potential application. *All the, every one of the* (*unusquisque*) in a concrete universal proposition signifies what Hamilton calls 'definite omnitude'.[2] The words which express universality and particularity need careful discrimination—as, *omnis, totus, cunctus, universus, singuli, nullus non, unusquisque*, πάντες, οἱ πάντες, ἕκαστος, πᾶς τις. Again, *aliquis, quidam, quisquam, nonnulli*, &c.; τινες οὐ, οὐ πᾶς, &c. The English marks of quantity are especially meagre and ambiguous. Frequently, of course, a universal has only the indefinite or definite article, or a possessive pronoun ('Your lion is a wild fowl'), and some languages, as Latin, lack even the article.[3]

[1] Yet 'some man', even though unidentifiable, might stand as the subject of two affirmative premisses (*Darapti*), so long as it were known to be the same 'somebody' in both. Thus—'Somebody or other stole my umbrella and afterwards sent it back again. It follows that thieves occasionally have consciences.' The empirical school of writers, in their anxiety to dissolve knowledge entirely into experience of separate facts, set up *Darapti* as the type of inference—'*X* is *Y* and also is *Z*. Then there is a possible association of *Y* and *Z*' (see Bradley, *Logic*, p. 44).

[2] 'All the *X*'s' assumes that there are *X*'s—hence the great 'the' fallacy of *petitio principii*. Yet 'All the *YX*'s'—All the *X*'s which are *Y* —is less assumptive and more hypothetical. 'All the children must leave the camp' takes it more for granted that there are such, than 'All children under ten must leave' would do. The latter combines an assumptive with a hypothetical element. This combination is most often found in imperative sentences.

[3] The true Universal or Abstract Judgement cannot be enumeratively exhaustive, for the 'allness' is not gained by counting up to the point at which an already ascertained totality is reached—as in 'Five of the (twelve) months', 'All the (seven) Champions'—but is the intellectual apprehension of a general principle or law. Such a law may be discovered from a single positive and a single negative instance. It is essentially ideal, not empirically finite. The 'all' of the generic judgement has no limit in thought, though it may have one actually. Bosanquet regards 'Man as such is mortal' as the type, and 'All men are mortal' as a transitional form between this and a collective judgement (*Logic*, i. 169). He calls 'All men are mortal' exhaustive, and maintains that in it 'form and meaning are at variance'. He fails, I think, to notice that it is not 'all' but 'all the' which conveys the idea of completed enumeration. An

§ 571. Quantitative expressions may form part of subject or predicate without affecting the proposition—e. g. 'We are each *all* Dane in our welcome of thee' (cf 'totus in illis'); 'He is every inch a king'; '*saepe* cadendo gutta cavat lapidem.' 'What is occasional and exceptional may be ignored' is not a particular judgement, nor in the proposition, 'That which has been held always, everywhere and by all is true,' does the *semper, ubique et ab omnibus* add anything to its universality.

The qualification of a notion by a quantitative idea, or the idea of duration or totality, is of course common—e. g. 'a universal hiss' (Milton)'; 'unceasing praise' (Sterne speaks of 'an unceasing wife'); 'everlasting night' ('in aeternam clauduntur lumina noctem'); 'An eternal sin' (St. Mark iii. 29, R.V.); 'an ever-victorious army'; 'a perpetual curate'; 'Hope springs eternal'; 'All partial evil universal good'; 'universa vanitas omnis homo vivens'; 'A thing of beauty is a joy for ever.' 'There is no smoke without some fire' is universal, not particular.

§ 572. The marks of the Particular Judgement are, in English, such as *some, several, many, most, a few, five, one in twelve, a large number, the majority, nearly all, usually, mostly, not all, some not, many not, scarcely any, seldom, not often, not always.* Or phrases like 'Instances have been known of', &c. ; or, 'There are who,' &c., cf. 'interdum vulgus rectum videt, *est ubi* peccat.' 'There is a friend that sticketh closer than a brother' is particular if no known individual is intended, singular if otherwise. 'All the months but one' is particular. 'All the months but March' is concrete-universal. So 'Ye are clean, but not all', was concrete-universal to the Speaker, who knew who the eleven clean ones were, but particular to the hearers, who did not.

§ 573. The following are various examples of particular propositions—though from another point of view, as we have seen, many of such judgements may be regarded as generalizations within a large sphere of discourse (It is a rule found true of A's that some of them are B's) :—

Non omnia possumus omnes.

Man in the aggregate lives principally in Asia.

'all' gained by counting must be in relation to an ascertained totality; for enumeration cannot be the warrant of its own completeness. In an abstract judgement we might count on the fingers for ever without attaining to all-ness. How many in such judgements is *all*?

The Austrian empire consists chiefly of health resorts.

We are not cotton-spinners all.

En réalité peu de personnes ont le droit de ne pas croire au Christianisme (Renan).

Some truths are found in each school, but not all in any (Heylin).

Non omnis fert omnia tellus.

The poor in a loomp is bad.

All flesh is not the same flesh.

Ridentem dicere verum Quid vetat ?

Loan oft loseth both itself and friend.

Great men are not always wise, neither do the aged understand wisdom.

Something is rotten in the state of Denmark.

<div align="center">We find</div>

Many for many virtues excellent,
None but for some, and yet all different (*R. and Juliet*).

Non semper erit aestas.

When I shout Murder! I am not always being killed (Carlyle).

Cucullus non facit monachum (not necessarily).

Nihil est ab omni parte beatum.

'Tis seldom when the bee doth leave her home
In the dead carrion (*Henry IV*).

Geniuses do not grow on every hedge.

οὐχ ἅπαντα τῷ γήρᾳ κακά.

The race is not always to the swift.

Monarchs seldom sigh in vain.

They rode back but not, Not the six hundred.

Facies non omnibus una.

Non quicquid morale est bonos mores facit.

The Few shall not for ever sway,
The Many moil and sorrow (Massey).

Non omnis moriar, multaque pars mei Vitabit Libitinam.

With which compare—

Some parts may perish ; dye thou canst not all ;
The most of thee shall 'scape the funerall (Herrick) ;

or, Non totus obit, petiit pars caelica caelum ; or, Quid moror altera ? (sc. pars mei).

In Hellenistic Greek, as in Hebrew, 'not all' often means ' none '—e. g. οὐ δικαιωθήσεται πᾶσα σάρξ. The Vulgate imitates this idiom—' non iustificabitur omnis vivens.'　　Again, ' non est impossibile apud Deum omne verbum ' ; ' non confundar in aeternum '.　At Eph. iv. 29 we have πᾶς λόγος σαπρὸς ἐκ τοῦ στόματος ὑμῶν μὴ ἐκπορευέσθω, where, however, πᾶς precedes μή.

§ 574. Bosanquet observes :—

'The Plural Judgement, or the Particular of traditional logic, differs in no essential respect from the Singular.　It is not, however, accurately described as a mere aggregate of singular judgements. . . . I cannot doubt that the plural judgement is a single act of thought.　It is not an aggregate of judgements, but a judgement about an aggregate.　Therefore the number is to be regarded as a predicated content or determining condition attributed to a whole consisting of the units which have been counted up to the point at which the plural judgement is taken.'[1]

§ 575. The expression 'singular judgement', however, is ambiguous.　We must proceed to examine it. In the scheme suggested above there is a Singular judgement under Universals and a Singular judgement under Particulars.　'Tiberius Caesar' I class with 'all the Caesars', but 'one of the Caesars' with 'four', or 'many', 'of the Caesars'.

Ueberweg states the distinction correctly.　He says :—

'Singular subjects are to be subsumed under Universal when the subject is definite and individually designated (Caesar, this man), but under Particular when indefinite, or designated only by a general notion (e. g., a man, a great general).'[2]

Hamilton remarks :—

'That Individual Judgements do not correspond to Universal Judgements merely in virtue of the oneness of their subject, is shown by this—that if the individual be rendered indefinite, the judgement at once assumes the character of particularity.　For example, the propositions, *A German invented the art of printing, An Englishman generalized the law of gravitation,* are to be viewed as particular propositions.　But if we substitute for the indefinite expressions a *German* and an *Englishman* the definite expressions *Fust* and *Newton,* the judgement obtains the form of an universal.'[3]

[1] *Logic,* i. 160, 161.　　　　　　　[2] *System of Logic,* § 70.
[3] *Lectures on Logic,* i. 247.

§ 576. But the erroneous reason which, he says, 'logicians in general' give for always classing Individual with Universal propositions, viz. that 'in both something is predicated of a whole subject, and neither admits of any exception', would not be erroneous at all if the fact were true. 'Some member of the club has taken my umbrella' is a proposition about one object, but what is predicated is not predicated of the whole subject (club members), but of a particular portion of it, viz. one member. The possible extension of the subject term is not exhausted. This will be at once obvious if we take a universal—'All the members of the club are respectable.' What is predicated is 'predicated of the whole subject', viz. (indefinitely) members of the club. 'The whole of *all* the members of the club' would be nonsense. The subject of a proposition is the term about which any thing is predicated, *apart from quantification*.[1] Through not noticing this, Hamilton goes on to say :—'A Particular Judgement, likewise, predicates something of a whole subject, and admits of no exception ; for it embraces all that is viewed of the subject, and excludes all that is viewed as not belonging to it.' It is surely paradoxical in the extreme, as well as meaningless, to say that 'A few novels are worth reading', states something about a whole subject, and that 'Not many mighty are called' is an assertion admitting of no exception.

§ 577. A Singular subject, then, is to be classed with Universals if individually designated and pointed to—but with concrete, not abstract, universals. If I say, 'All my uncles are dead,' or 'My uncle Henry is dead', I can point to a miniature and say, 'That is an uncle of mine,' or 'That is my uncle Henry'. It follows that the person whose picture that is is no longer alive. But if I said, 'All of my uncles but one are dead,' or 'One of my

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[1] It should be noticed that whereas in 'All horses are quadrupeds', 'Some horses are timid,' 'Six horses are lame,' the subject is 'horses', in propositions stated with reference to a pre-determined total, such as 'All the horses, Six of the horses, Some of the horses, are lame', the subject is not 'horses' but 'the horses'. In 'Two of the six horses are lame' it is 'the six horses'. In fact, the distinction between abstract and concrete universals—'all *A*'s' and 'all the *A*'s'—disappears if this be borne in mind. In the concrete as in the abstract proposition 'all' will mean 'all possible'—an ideal universality. 'All my furniture is sold' means all things, whatever they be, which can be described as my furniture, all possible instances of it, are sold.

uncles is dead', the production of the portrait would allow no inference to take place.

§ 578. 'Singular-universals' have for subject a proper, or quasi-proper, name—Dr. Johnson, Bath, the Blue Mountains, the *Medea*—; or a common name used as a proper designation—hall, chapel, dinner, βασιλεύς, &c.—; or a name marked out by the definite article or a demonstrative pronoun or in some other way—the oldest member of the House, my mother, last Friday week—; or a personal pronoun—'Je suis moi-même la matière de mon livre'(Montaigne)—; or an abstract or quasi-abstract noun—philanthropy, music, fate, art—; or a collective noun or impersonation—man, John Bull. The definite article, of course, frequently designates a class of objects; in which case the proposition is general. Distinguish 'The cleverest boy gets all the prizes' and 'The cleverest boy got all the prizes'.

§ 579. Sigwart remarks :—'A concept can never be called singular because there happens to be only one thing corresponding to it in empirical reality,[1] any more than the logical nature of the concept would be affected if there were no object whatever corresponding to it. Only concepts whose characteristics involve the uniqueness of the corresponding object can be called singular. In this sense the centre of the material universe is a singular concept.'[2] But the form of thought is not affected by the empirical correctness or incorrectness of our conceptions. ' My guardian angel ' is a singular expression even though in fact I have none, or have ten legions.

§ 580. Sigwart, distinguishing singular judgements as individual ('Callias is rich'), numerical ('One planet has a ring') and particular ('There is such a thing as a comet which has broken up'), and noticing that the first can, but the other two cannot, be classed with Universals, objects to the ' customary plural ' of the Particular Judgement. 'One man is sinless' is as particular as ' Some men are sinless '. He might equally object to the ' all ' of universal judgements. Nor would ' A is always B ', ' A is sometimes B ' fit every case of a singular proposition. Yet ' A is in this case B ' goes with ' A is in all cases B '; and ' A is in one case B ' goes with ' A is in some cases B '. ' I think there

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[1] There was a man who boasted that his father was the only provost of Dundee who had ever swum the Hellespont.

[2] *Logic*, i. 271.

be six Richards in the field ' and ' unus homo nobis cunctando restituit rem ' rank together.

§ 581. ' Every single day has its blessing ' is a general, not a singular, proposition.　So is ' singulos dies singulas vitas puta ' (Manchester *al Mondo*).　Also the following (cf. above, § 549) :—

One touch of nature makes the whole world kin.

One soweth, another reapeth.

Una instantia cadit inductio.

One good turn deserves another.

One fire drives out one fire, one nail one nail (*Coriolanus*).

One man's meat is another man's poison.

Ab uno disce omnes.

If two ride the same horse, one must sit behind.

One tale is good till another is told.

Through the ages one increasing purpose runs.

One may steal a horse, while another may not look over the wall.

One man can do only one thing (Plato).

One crowded hour of glorious strife Is worth a thousand years of ease.

Any stick will do to beat a dog with.

§ 582. Bearing in mind the broad distinction between propositions which can be used as major premisses and those which cannot, it is impossible to agree with Sigwart when he says :—

' We have no ground for treating particular and universal judgements as special kinds.　There is no more reason in the ordinary logic for regarding judgements having ' all ' for a predicate as a special kind, than there is in mathematics for regarding judgements having the predicate ' equal ' or ' infinite ' as a special kind.　Hence it is an arbitrary proceeding on the part of the traditional Logic to ask of every judgement whether it is particular or universal.'

He goes on to observe that—

' The Particular Judgement, as ordinarily treated, is one of the most unfortunate and inconvenient creations of Logic.'　' Some A's are B implies an empirical knowledge of part of the extension of the subject.　Such a formula was rational enough according to the view of Nature taken by Aristotle ; a view which starts from the idea that a fixed and immutable order of

concepts has realized itself, and is constantly realizing itself, in the forms of Nature, and that our empirical knowledge surveys the realization of the concept in all its essential differences. But when the later Logic, dealing only with conceptual relations, and totally disregarding the material realization of the concept, took up the Aristotelian distinction [between universal and particular] and made use of its formulae—or rather of a bad translation of them—the result was a host of absurdities. . . . The Aristotelian τινὶ ὑπάρχειν, μὴ παντὶ ὑπάρχειν, is generally translated by the formula ' Some A's are B ' ; but the plural here can have a meaning only when applied to things which are particular and definite, and can therefore be counted ; in which case it presupposes a narrative judgement treating of the actually existent. . . . When, however, we are dealing with abstract subjects, whose extension does not consist in a plurality of things, the formula leaves us in the lurch. Must we say, ' Some virtue is justice ' or ' Some virtues are justice ' ?[1]

§ 583. Certainly Logic has been cramped by its inherited formulas. But Sigwart's protest against the formula of the Particular Judgement does not seem important. We must have a formula ; and ' Some A's are B ' is more generally applicable than ' Some A is B '. It is true that *semper* and *nonnunquam*, or similar adverbs, can nearly always be used, but *omnes, aliquot* and *aliquod* not always. Yet we can say ' Some philanthropy is misdirected ' when the subject is an abstract expression, and the proposition quasi-general, as well as ' Some boys have got the measles '.

§ 584. It should be observed, on the other hand, that as *all* and *some* qualify a subject, so *always* and *sometimes* cannot have an absolute significance, but mean in all cases, in some cases, *of the occurrence of the subject.* ' Motor cars are for ever getting out of order' does not mean that eternity is filled with such phenomena, but that wherever there is a motor car there is getting out of order. On the other hand, quantitative expressions which have an absolute significance, as *five, several, a few*, can be separated from the subject. ' Twenty passengers are injured' —the injured passengers are twenty in number.

§ 585. Quantity, then, though adjectival, does not qualify the subject in the same way that a determining adjective does. ' Gold mines are valuable' could not be expressed in the form— ' The valuable mines are gold ones.' It should be noticed that

[1] *Logic*, i. 166, 167.

when quantitative expressions like *all* and *some* are exhibited as predicates, their distributive force becomes a collective one. 'All cats, some cats, love milk '—the cats who love milk are *the whole number*, are *a portion*, of the class. And whereas 'All men are mortal ' stands for 'are men-mortals ', are the human section of the class mortal, this, with 'all' as predicate, becomes, 'Mortal men are all men.'

§ 586. Employing the usual signs *A* and *I* (*AffIrmo*) for universal and particular affirmative propositions, and *E* and *O* (*nEgO*) for universal and particular negative propositions, respectively, *A* indicates that a dictum must always[1] be found true, *I* that it may be, *E* that it cannot be, and *O* that it need not be.

Or grouping each with its contradictory, *A* implies that the *dictum* is necessary, *O* that it is not necessary, *E* that it is impossible, and *I* that it is not impossible. Grouping by contraries, *A* and *E* indicate what is always the case, declare the rule; while *I* and *O* indicate what is occasional and exceptional.

§ 587. *I* and *O* do not contradict one another;—τὸ τινί, says Aristotle, τῷ οὐ τινὶ κατὰ τὴν λέξιν ἀντίκειται μόνον.[2] But if 'some' meant 'certain', the same individuals in both propositions, or if the two subjects overlapped—as, 'Most *X*'s are *Y*,' 'Most *X*'s are not *Y*'—there would be contradiction. 'Some' must usually be taken to mean 'some at least'. But if a stress is laid on the word, 'some only' is probably intended. '*Some* people think so'—meaning that others do not. In this case *I* and *O* imply one another. Sigwart censures 'the thoughtless habit of substituting the plural "some " for οὐ πᾶς and τις '.[3] πᾶς and οὐ πᾶς, says Aristotle, are opposed, οὐδείς and ἔστι τις.

§ 588. Though particulars are contradicted by universals, and 'many' and 'a few' are marks of particularity, 'not many' (= few) and 'not a few' (= many) are also particular. Again, affirmatives are contradicted by negatives. But if 'some' has the

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[1] Yet while 'All, or some, *X*'s are *Y*' can be expressed, '*X*'s are always, or sometimes, *Y*,' 'All, or some, of *the X*'s are *Y*' requires 'in all instances ', 'in some instances.' 'Some sailors can swim ' = 'Sailors can sometimes swim'. 'Some of our sailors can swim ' = 'Our sailors can in some cases swim.'

[2] *An. Pr.* ii. 15, 63^b27.   [3] *Logic*, i. 173.

sense of 'some only' (*non quivis*),[1] it is contradicted by *A* (*quivis*) rather than by *E* (*non ullus*). It is the 'only' which is negated. Sometimes the 'only' when denied is not expressed. 'Not once or twice in our rough island story', &c.; i. e. often. 'Not all' may mean 'not even all'—as in 'Not all the waters of the rough, rude sea', &c.; where 'all' is collective.

§ 589. When the incompatibility of contradictories is expressed disjunctively, the expression is apt to be ambiguous. 'Either every *X* is *Y* or it is not' may mean (1) Every *X* either is or is not *Y*; or (2) Either every *X*, or not every *X*, is *Y*. 'Either some *X*'s are *Y* or they are not' can only mean 'Either some *X*'s, or not any *X*'s, are *Y*'. For 'Some *X*'s either are or are not *Y*' would be an otiose proposition, since this must be true of all *X*'s.

§ 590. *Nullus* is *ne-ullus* (*ne-unulus*), *nemo ne-homo*, οὐδείς οὐδὲ εἷς, *none ne-one*. *Nulli* and *nonnulli* are opposed, τις and οὔτις, *omnis* and *non omnis*. For *omnis* we can write *nemo non* or *nullus non*.[2] Let it be observed, however, that 'omnis *X* est *Y*' is not equivalent to 'nullus non-*X* est *Y*', but to 'nullus *X* non est *Y*'. Yet Bishop Stubbs's saying, 'There are two sides to everything —except Reading station,' may be expressed thus: 'nullum non-*X* non est *Y*.' And Maine's remark, 'Except the blind forces of Nature, nothing moves in this world which is not Greek in its origin,' is of the form—'nullum non-*X* non-*Y* est *Z*'. More simply—'omne non-*XZ* est *Y*'.

§ 591. Interrogations expecting a contradictory reply are answered, *A* by *O*, *O* by *A*, *E* by *I*, *I* by *E*. Have all gone? No, not all. Are there some who have not gone? No, all have gone. Is there no wine? Yes, there is some. Is there any wine? No, not any.

§ 592. In *O* propositions, 'Some *X*'s are not *Y*,' the negation is thought as attaching to the predicate, not to the quantification (yet for 'Some are not' we might say 'Not all are '), for it is not

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[1] But such a proposition is really a double one—'Some men only are black' affirms that some men are black (contradicted by *E*) and some are not black (contradicted by *A*).

[2] The latter is sometimes more natural than the former. 'Every one of the seventeen prisoners answered to his name' might be *omnis* or *nullus non*. But 'Every one of them has escaped' would be learned, not by counting up to seventeen, but by seeing the guard-room empty, with not a prisoner in it.

particularity which is denied but universality. We shall see that an O proposition can only thus be converted—Some non-Y's are X. 'Some X's are not Y' is of the same form as 'Eight X's are not Y'. 'Not eight X's are Y' means 'Less than eight'. In an E proposition, it is, in the given sphere of discourse, the same thing whether we say, 'No children are experienced' or 'All children are inexperienced'.

CHAPTER XVIII

NEGATION AND MODALITY

§ 593. I<small>F</small> a quantified proposition be denied, the denial must be taken to apply to the quantity only, unless emphasis has been laid on some other word. If I demur to the proposition 'All men are born *good*', I may perhaps mean that all men are rather born bad or imperfect.

§ 594. In every proposition it is the word or element in which the mind is directly interested which is the real mental predicate, and which feels the force of any negation, even when it comes first in the sentence.[1] Thus 'All that glistens is not gold', or 'Every cloud engenders not a storm', is an *O* proposition. Compare 'ex quovis ligno non fit Mercurius', or 'All things are not expedient', or '*Every one* cannot (*non cuivis contingit*) go to Corinth'. In Symmachus's striking expression, 'uno itinere non potest perveniri ad tam grande secretum,' *uno* is emphatic —not by one road only. In 'They shall not plant and another eat thereof' the negation is directed against *they* and *another*. Compare 'Men make cities, not walls'. An unintelligent reader might emphasize the word 'cities'. Where a proposition has no marks of quantification, however, the interest is usually in the predicate. Denial then may merely demur to the truth of the predication. E. g. 'The Gracchi were patriotic'. No, they

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[1] For πᾶς οὐ see Winer, *Greek Grammar*, p. 196. The parts of the judgement do not lie evenly in the mind, and the denial falls upon that element on which a mental or vocal emphasis is laid. Thus, 'Thou bearest not the root, but the root thee.' 'The fathers should not provide for the children, but the children for the fathers.' For whatever part of the grammatical sentence the stress falls on is the logical predicate. Even 'the' may hold this position. '*Ivanhoe* is *the* book to give a boy.' Among books to give a boy *Ivanhoe* holds a unique place. In Latin, emphasis falls on any word which is in an unusual place—a pronoun, for instance, placed first—'Vester, Camenae, vester in arduos Tollor Sabinos.' 'Me, me, in me, convertite ferrum.' The French idiom is more analytic than the English—'The *first* step only is the costly one '—' Ce n'est que le premier pas qui coûte '.

were not (ils ne *l'*étaient pas). That this need not necessarily be read, 'No, they were unpatriotic,' is shown by the re-affirming rejoinder, 'Yes, they were.' Such emphasis on the 'copula', unless it draws attention to the tense ('fuimus Troes,' 'This *was* my son '), is the denial of denial.

§ 595. In English 'not' is usually placed after the 'copula' or auxiliary verb—' He is not mad '; 'I do not play '; 'you cannot go '—, and in rhetorical or poetical speech after the ῥῆμα— 'I care not '; 'He descended not.' The English tendency is to attach the negation to the predicate. In most languages 'not' stands before the verb. In French, however, *ne* before a verb, with *pas, rien*, or *personne* after it, negates the latter, as in our 'not a soul ', 'not a doit,' 'not an inch.' In English 'not' or 'never' before the so-called copula usually negates the tense ; as in Pope's line, 'Man never is, but always to be, blest.' We might say, rather clumsily, 'She not *had been*, but still was, very ill.'

§ 596. The view of negation expressed by Sigwart seems, then, clearly to be correct, though Bosanquet calls it 'monstrous '. It is, Sigwart says, always directed against a tentative or suggested synthesis.[1] Accordingly negative judgement is not co-ordinate and equally primitive with positive. It

'pre-supposes the attempt, or at least the thought, of an affirmation—that is, it pre-supposes the positive attribution of a predicate, and has a meaning only in contradicting or annulling such an affirmation. Or rather, the primitive judgement should not be called affirmation at all ; it would be better described as positive. The simple statement, '*A* is *B*,' is an affirmation only when opposed to the negative judgement, and in so far as it rejects the possibility of a negation.'

He goes on :—

'When we consider that only a finite number of predicates can be affirmed of every subject, while an incalculable number can be denied, it is at once evident that the negation has no meaning except in opposition to an attempt at a positive statement. . . . No one could say, Justice is not five-cornered, unless there was a chance of some one saying it *is*[2]. . . It is impossible

[1] *Logic*, i. 122 seq.
[2] 'Negation pre-supposes an idea *suggested* as true of Reality within a state of facts *judged* to be true of Reality. . . . The suggestion which denial pre-supposes is not a mere floating content, but a suggested qualification of reality' (Bosanquet, *Logic*, i. 295, 296). This is clearly

to lay down universally and exhaustively what must necessarily be denied of any subject.'

Kant is wrong in thinking that an 'aoristic' predication (Aristotle's ῥῆμα ἀόριστον) is possible ; as if 'The soul is not mortal' could mean 'belongs to the infinite sphere of things outside mortal' (i. e. has one or more of the infinite number of attributes which are not mortality). He says himself that 'negative propositions have the peculiar faculty of simply averting error'.

§ 597. To the question whether the negation affects the copula Sigwart answers that it is so far true that the negation does not lie in the elements of the judgement, but only in the manner in which they are referred to each other. But it is incorrect to oppose a negative to an affirmative copula. The copula represents a unifying mental act ; and the negation, 'which holds subject and predicate apart, and prevents the attainment of unity, cannot be a kind of unification. A bond which divides is nonsense.' In negative as in affirmative judgements, the copula expresses the positive judging relation between subject and predicate, the attributing of the predicate to the subject. But it is just this attribution which negation declares to be false. 'The copula does not convey the negation, but is the object of it. *There is no such thing as a negative, but only a negated, copula.*' The negation follows the different forms of the positive judgement, and may apply to any part of the grammatical subject or predicate, wherever the true logical predication lies—e. g. 'It is not in my *left* hand ' ; '*Charles* is not coming, but Edward ' ; 'My poverty but not my will consents.' This again shows that it is unable by itself to constitute any definite relation. It merely annuls another statement, and is not directly and independently significant.

§ 598. Aristotle makes affirmation correspond to a composition or unification (συγκεῖσθαι), and negation to a division or severance (διηρῆσθαι). But the predicate cannot be thought as a separate, self-existent idea. Spinoza's formula, '*determinatio est negatio*,' makes everything to be what it is because it is not something else. A is B because it is not C, not D, not E, not F. In predicating an attribute, however, we are not asserting our

seen in sentences like—'Not as the offence, so also is the free gift'; 'He is not a Jew which is one outwardly'; 'num, quia frater meus es, gratis servies mihi?'

psychological inability to think anything without discriminating it from other things. We are declaring what the real nature of the subject is. Sigwart might have insisted more plainly that 'A is not non-B' can only mean, 'is not something which is incompatible with B.' The import of negation is not ' I do not affirm X to be Y', but ' I affirm that X is not Y'. In Greek οὐ φημί is the Latin *nego*, which means ' I assert that not '.

§ 599. From this view that Negation is 'a judgement concerning a positive judgement that has been essayed or passed, and only indirectly concerning the subject of the judgement'[1] Dr. Bradley dissents, but I think without cause. It may, however, be objected, If 'X is not Y' means ' It is not the case that X is Y', does not the problem remain where it was? Have we not simply made the proposition 'X is Y' the subject of a negative judgement, and how then are we to avoid a *regressus ad infinitum*? ' I assert the proposition affirming the truth of the affirmation "that X is Y is true" to be untrue'—and so on. The only answer we can make to this objection is that 'is untrue' is not just 'is true' negated, but that 'contrary to fact' is an ultimate and simple idea, necessarily implied in the notion of unreality. Falsity, like sin, is a metaphysical entity, and not a mere correlative in thought.[2]

§ 600. The attachment of 'not' to the predicate, moreover, only shifts the question for a moment; for 'not sheep' means 'that which is not sheep', and 'unwholesome' means 'what is not wholesome'[3]—where subject and predicate have reappeared. We have seen that it is only in certain appropriate 'universes of discourse' that not-Y (negative) means un-Y (privative). When

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[1] Sigwart remarks that, if '... is' states the subject's existence, 'is not' must deny it, which, he says, is certainly not the case. I have shown above that the verb 'to be' does connote existence, but not absolutely. 'X has *its mode of* existence as Y.' 'X is not Y', then, does not mean X is non-existent as Y', but 'X has its existence as not-Y' (or 'It is untrue that X has its existence as Y'). Sigwart correctly says: 'The negative judgement in itself states no more concerning existence and non-existence than the affirmative judgement.'

[2] Ueberweg dissents from Aristotle's endeavour to find a form of metaphysical existence as a correlate to negation, viz. separation—ἀπό-φασίς τινος ἀπὸ τινός.

[3] Hobbes held that all assertion is affirmation. 'Pigs are not sheep' means 'Pigs are not-sheep', as 'Some berries are not wholesome' means 'are unwholesome'.

it is said that Art is non-moral this must not necessarily be taken to mean immoral. Our acutest faculties are non-rational, but not irrational.

§ 601. Attached to the subject, 'not' has no influence on the predication—e. g. 'It is easy not to write an epic poem'; 'Not to relent is devilish' (*Ric. II*). In Dryden's line, 'Not to wish is not to be deceived,' the second 'not' must be taken into the predicate—non-X is non-Y—and cannot be understood as qualifying 'is', which here means 'is equivalent to'. Of the same form are propositions like 'No pains no gains', 'No cross no crown,' 'Point d'argent point de Suisse,' 'Not in Kent not in Christendom,' 'No penny no paternoster.' Since 'No X is Y' can be expressed thus, 'X is not any Y,' we get judgements such as 'Exchange is no robbery', 'Self-praise is no recommen‧dation,' 'Force is no argument,' 'Killing no murder.' Emerson declares that nature is no saint.

§ 602. To sum up. In 'No X is Y' it is neither the subject which is negated (non-X is Y), nor the universal quantity of the judgement (Not every X is Y), but the attribution of Y to any X whatever. Take any X you please, to say that it is Y is untrue. Accordingly, Every X is non-Y. Only let it be remembered that a notion cannot be entirely negated, but only the inherence of its adjectival in its substantival element.[1] An orange is not black (coloured),—but it has some other colour; or at any rate there is some substratum of reality which remains undenied. If a predicate were negated in all its parts, ludicrous judgements might be the result. E. g. 'Piteous appeals never reach the rich philanthropist—in vain'; 'It never rains—but it pours.' Waller the poet declared that he was unable to read Chapman's *Homer*—without rapture. We have to look always for the emphatic element in a proposition; i. e. for its *interest.* 'He is not badly wounded' might mean (1) he is wounded, but not badly; (2) he is badly shaken, or frightened, not wounded; (3) he is killed; (4) he is unhurt; or (5) it is some one else who is badly wounded.

[1] Bosanquet says that the attribute to which is attached the interest that guides the selection of the content used in judging 'cannot precisely coincide with the content denied; for, if so, no result in which we had an interest would spring from the denial' (*Logic*, i. 302). But surely the logical reason is somewhat deeper, and lies in the essential form of all thought.

§ 603. An idea is always denied as to its entire extension, from which the subject is wholly excluded, but only as to part of its comprehension.[1] A square is not a triangle; but it has angles. A triangle is not a square; but it has sides.

§ 604. It is often said that it is difficult to prove a negative. Sir Thomas Browne says that there are no toads, but there are spiders, in Ireland. He had seen a spider there. It is, however, not more difficult to prove a negative than an affirmative—that 'No Scot can see a joke' than that 'Every Englishman is illogical', that 'Earth hath not anything to show more fair' than that 'This is the fairest view on earth'—; but it is harder to prove a universal proposition than a particular fact. It is only because particular propositions commonly present themselves in a positive form that the opposing universal, with its difficulty of proof, seems usually to be negative. It is easier to show that James came yesterday than that he did not do so, because the former assertion relates to a single event and point of time, and is evidenced by a stick left behind, or a footprint found, while the latter is a general proposition relating to a whole day, and insufficiently proved by stick or footprint not being found. The distinction, then, is between general and concrete affirmations, not between affirmative and negative.[2] These are always interchangeable—e. g. 'Every one knows' with 'nemo nescit'. Sometimes, no doubt, an enumerative affirmative universal is more quickly verified than a negative—e. g. 'They are all wounded' than 'They are none of them wounded'. But at other times we convince ourselves more quickly of a negative; e.g. that not a seat in the concert-hall is occupied—which is seen at a glance—than that every seat is occupied.

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[1] See above, §§ 423 seq. The Port Royalists put it thus: 'The negative proposition does not separate from the subject all the parts contained in the comprehension of the attribute, but only the total and complete idea composed of all these attributes.' To the agriculturist 'not cereal' probably means roots; as in the tale of the early-Victorian incumbent who had planted the churchyard with oats. *The Archdeacon:* 'This is very wrong.' *The Churchwarden:* 'I told en 'twas wrong, and that it should have been turmets.'

[2] Peter Ramus, aged twenty, for his Master's degree at Paris, undertook to demonstrate the thesis, 'Whatever has been said by Aristotle is false'—to prove which every sentence in Aristotle's writings would have to be scrutinized. But the thesis would have been the same in the form, 'Nothing that has been said by Aristotle is true.'

MODALS

§ 605. Having considered the Quantification of propositions, and also the import of Negation, we are led next to examine the import of Modified Assertion.

Some modal expressions are seen clearly to attach to the predicate ; others must be considered as qualifying, and as extraneous to, the whole judgement. 'He is happily married' has a different meaning from 'He is, happily, married' ; 'He is unfortunately circumstanced' from 'Unfortunately he is dead'. We distinguish adverbial expressions like 'He is plainly dressed', 'grievously sick,' or 'easily convinced', from 'He is plainly wrong', 'Seemingly he is mad,' and the like.   The latter class of adverbs is modal.   'That he is wrong is plain', &c.

§ 606. It is the same distinction which we drew above (§ 571) between quantifying adverbs which are most naturally taken as affecting the predicate only, and those which can themselves become predicates with the *dictum* as subject.   Of the former class are such as 'Souvent femme varie' ; 'The dead are always right' ; 'Les absents ont toujours tort' ; 'Kings are scarcely ever at leisure' ; 'They were half-and-half patriots' ; 'The excellence of the classics lies chiefly in their uselessness' ; 'The crew were mostly tipsy.'   But in 'Kings are scarcely ever cowards', 'Women are often braver than men,' 'The dead are always buried in woollen,' 'The crew were mostly Portuguese,' the adverb might stand outside the proposition—e. g. 'That women are braver than men is in many cases true,' &c.[1] .

§ 607. The question of Modality, however, arises rather in the

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[1] Bosanquet contests Kant's doctrine that 'modality affects only the copula in judgement, and that therefore, though a measure of assertiveness, it is indifferent to the content affirmed'.   Both this and the opposite view, that 'modality is a peculiarity of the content affirmed which does not affect the essential act of predication', 'by separating the assertive-ness of assertion from the content asserted, represent judgement as an arbitrary and irrational activity. . . . Logical, unlike psychological, certainty depends on reasoning, and is therefore incapable of more or less, and is the chief element in the assertiveness of judgements.   It follows that modality is, as Kant said it was *not*, a characteristic of the content affirmed, but is also, for that very reason, as the moderns say it is *not*, a measure of the assertiveness of assertion.   Whether modality must be said to affect the " copula " at all, or the " copula " only, depends on what we mean by the copula' (*Logic*, i. 377–9).   The traditional logic regards

case of problematic judgements and those asserted to be neces-
sary. Do words like *perhaps, possibly, probably, undoubtedly,
necessarily,* constitute a 'modification of the copula'? Not, if
by the copula is meant the assertive force of the proposition.
'Mankind,' says Pascal, 'are necessarily mad, and not to be
mad is a new kind of madness.' Now 'necessarily-mad' can
have no meaning out of predication. Does then 'necessarily'
here qualify the word 'are'? Or does it govern the whole
judgement? That all men are mad is necessarily true. It
is not the 'copula' which is modified; nor yet the content
regarded in itself as a notion; but the content *as affirmed.*
A problematic judgement asserts the subjective *mode* under
which the *dictum* is regarded as real. The proposition is
qualified by a reflective estimate of its more or less of certainty.

§ 608. Necessity and probability, as Mansel observes, are
products of the act of thought—states of mind, not modes of
reality. Psychologically, then, the connexion between predicate
and subject is judged problematically. But logically and ration-
ally the connexion admits of no degrees. If the one cannot be
asserted of the other, it cannot. This is the meaning of the
Principle of Excluded Middle (see above, §§ 156 seq.), which lays
no emphasis on the content of subject or predicate, but, be the
content of X and Y what it may, asserts that either X is Y or X
is not Y.

§ 609. The way in which this or that mind regards a proposi-
tion must not be confused with the objective relation of its terms.
The subjective confidence or hesitation of the person who judges
is a judgement about the judgement—that it is certain or uncer-
tain, probable or improbable. *Modi sunt relationes ad intellectum.*
'Every judgement,' says Bosanquet however, 'may be called
assertory in virtue of its psychological reference to self-feeling.'[1]

§ 610. Every judgement is an inference (see § 26). Now an infer-
ence cannot but be necessarily drawn. If S is probably M and
M is P, we may 'probably conclude' that S is P. But this means
that we are *obliged* to conclude that S is probably P. A 'reason-

the 'copula' as formal, empty, and indifferent. But, 'if we extend the
notion of the copula to include the material or logical grasp by which
a complex content is fitted on to a complex Reality, then we may say that
Modality is a matter of the Copula.'

[1] Ibid. p. 389.

able inference' is, *qua* inference, cogent and binding on the mind which draws it. Butler pointed out that men are logically, and therefore morally, bound to follow Probability, if there is no doubt where the probability lies.

§ 611. The doctrine of Chances, in the same way, does not measure the *degree of expectation* which the individual forms in his mind, but rather the *rational ground* for supposing that the event will or will not happen as afforded by the knowledge which we possess. Relatively to this knowledge it is a fixed ratio. 'The probability of an event,' says Poisson, 'is the reason we have to believe that it has taken, or will take, place.' 'Probability,' says Boole, 'is expectation founded upon partial knowledge.' It would be more correct to say 'justified by' rather than 'founded on'; for the chances are what I ought to think them, not what I do think them. A peradventure might be calculated mechanically[1]—δοκεῖ εἶναι αἰτία μὲν ἡ τύχη, ἄδηλος δὲ ἀνθρωπίνῃ διανοίᾳ (Ar. *Phys.* ii. 4, § 8).

§ 612. The answer to the question whether the 'copula' is modified by tense and mood—'Were I not Alexander I would be Diogenes'; 'Si Cato reddatur Caesarianus erit'—depends on the distinction which I have urged between the verb 'to be' and the assertive energy of which it is the vehicle. Mill says that the futurity of 'The sun will rise to-morrow' cannot belong to the predicate since there are not different kinds of sunrising. And, though we might reply that the predicate really is 'a thing which will rise to-morrow', this only postpones the issue. When we have resolved 'Supper will be ready' into 'Supper is a thing which will be ready', we have still a 'will be ready' to consider.

§ 613. I think it must be agreed then that the verb 'to be' is

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[1] Chance is the ratio of the favourable events to all the events, favourable and unfavourable. Quetelet says that the chance of an event which has happened n times happening over again is $\frac{n+1}{n+2}$; the adverse chance is $\frac{1}{n+2}$. For example, if a man were for the first time to go to the seaside and witness on n days the rise of the sea. But see Cajoir, *History of Mathematics*, p. 340. Mellor (*Higher Mathematics*, p. 491) gives this formula:—If an event can happen in a ways and fail in b ways, the probability of the event happening is $\frac{a}{a+b}$, failing $\frac{b}{a+b}$.

inflected in thought by tense and mood. But, if the view taken above is correct, the verb 'to be' is always in thought substantive and never has a mere artificial copulative function. It is therefore itself asserted of the subject. On the other hand, this assertiveness of the judgement admits of no temporal or modal modification. It is in immediate contact with the judging *ego*. Every judgement starts from what is necessarily present—'I judge' or 'I assert'. 'The real is such that'—. Sir Thomas Browne observes profoundly that 'Reality, like Eternity, has no distinction of tenses'. Assertion, then, even when not grammatically *oratio indicativa*, must always be pivoted on the conscious *now*.

[1] Logically, says Mansel, 'all thought is the consciousness of present mental acts, and its object is not the past event but the present concept of it. The office of the copula is to declare the present co-existence of two concepts in the representative act of thought' (*Prol. Logica*).

CHAPTER XIX

IMPLICATION OF JUDGEMENTS

§ 614. HAVING so far elucidated the character of Judgements, we are able to consider what changes can be made in the form of a proposition without change of its meaning ; in other words, what differently worded propositions are implied in it. In particular, we have to examine the way in which, when a proposition is converted, its quality (affirmative or negative) governs the quality of the terms.

§ 615. Of the four kinds of Judgement, *A*, *E*, *I*, and *O*, the second and third convert 'simply', the first only 'per accidens' —All *X*'s are *Y*; Some *Y*'s are *X*. Yet, since 'All *X*'s are *Y*' is equivalent to 'No *X*'s are not-*Y*' (this change is called Obversion), *A* and *E* are seen to contain precisely parallel implications. Thus :—

'All *X*'s are *Y*'   'No *X*'s are *Y*'

contain the following implications respectively :—

Some *X*'s are *Y*   Some *X*'s are not-*Y*
[Some *Y*'s are *X*]   [Some not-*Y*'s are *X*]
No *X*'s are not *Y*   All *X*'s are (No *X*'s are not)
                                               not-*Y*
No not-*Y*'s are *X*   No *Y*'s are *X*
All not-*Y*'s are not-*X*   All *Y*'s are not-*X*
[Some not-*X*'s are not-*Y*]   [Some not-*X*'s are *Y*]

In these two sets of propositions, wherever *Y* appears in the one not-*Y* appears in the other. The propositions in square brackets are logically contained in the original proposition, but are meaningless apart from the assumption of the actual existence of the subject. For the existence of such a class of things is assumed in any predicate, but conditional in any subject (see above, §§ 471 seq.). When subject and predicate change places, the condition and assumption shift also.[1] Thus, we can

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[1] A friend objects : ' Of course, if you use terms which do not correspond to reality, you will naturally get propositions which fail to do so also.' But my point is that the original proposition is not unreal in the same

say without reserve that all existing mermaidens live in the sea, but not that some existing denizens of the sea are mermaids. The difficulty, however, ceases within an ascertained sphere of discourse—e.g. from 'Mermaids *in books* always comb their hair' we can safely infer that some who comb their hair *in books* are mermaids.[1]

§ 616. Every judgement, *A*, *I*, *E*, or *O*, may be expressed in four simple equipollent modes, from any one of which any of the other three may be obtained. Each is contradicted by a corresponding judgement—an *A* by an *O* and an *O* by an *A*; an *I* by an *E* and an *E* by an *I*. The *I* modes stand in a weakened relation to the *A* modes, and the *O* modes in a weakened relation to the *E* modes. The *O* judgements correspond exactly to the *I* judgements, and the *E* to the *A* judgements, with the reciprocal exchange of *Y* for not-*Y* and of not-*Y* for *Y*. Again, while *Conversion* preserves the affirmative or negative quality of the converted judgement, and also, in the scheme given below, its universal or particular quantity, but interchanges subject and predicate, *Obversion*, on the other hand, keeps the same subject, with the same quantity, but changes the quality of the judgement, and therefore the quality of the predicate. Thus :—

Contradictory Propositions.

A and its equivalents.	*O* and its equivalents.
1. Every *X* is *Y*	(5) Some *X*'s are not *Y*
2. No *X* is not-*Y* (obverse of 1)	(6) Some *X*'s are not-*Y* (obverse of (5))
3. No not-*Y* is *X* (converse of 2)	(7) Some not-*Y*'s are *X* (converse of (6))
4. Every not-*Y* is not-*X* (obverse of 3)	(8) Some not-*Y*'s are not not-*X* (obverse of (7))

way that its converse is unreal. 'Dragons are not ruminant beasts' is not so odd a proposition as 'Some non-ruminant beasts are dragons'.

[1] Yet the sphere may be a misleading one. For example, if 'Every human is mortal' be expressed thus, 'Every human animal is a mortal animal,' we get by obversion, 'No human animal is an immortal animal,' and from this, by simple conversion, 'No immortal animal is a human animal'; which is again obverted as, 'Every immortal animal is a non-human animal,' and this, when converted *per accidens*, gives us the paradoxical proposition, 'Some non-human animals are immortal animals.' In speaking originally of mortal animals we implied that they were only a portion of the animal class, and that 'mortal' was a differentia.

I and its equivalents.	*E* and its equivalents.
5. Some *X*'s are not not-*Y*	(1) Every *X* is not-*Y*
6. Some *X*'s are *Y* (obverse of 5)	(2) No *X* is *Y* (obverse of (1))
7. Some *Y*'s are *X* (converse of 6)	(3) No *Y* is *X* (converse of (2))
8. Some *Y*'s are not not-*X* (obverse of 7)	(4) Every *Y* is not-*X* (obverse of (3))

The respective corresponding numbers counterchange *Y* and not-*Y*.

§ 617. It is obvious that an *A* can always by Obversion be turned into an *E* judgement, and an *E* into an *A*; an *I* into an *O*, and an *O* into an *I*. *A* cannot, as it stands, be converted simply, and *O* cannot, as it stands, be converted at all—that is, 'Some *X*'s are not *Y*' implies nothing about *Y*. But it is the same judgement as 'Some not-*Y*'s are *X*'. And 'All *X*'s are *Y*' (its contradictory) is the same judgement as 'No not-*Y*'s are *X*', the contradictory of 'Some not-*Y*'s are *X*'. *O*, then, can only be converted by becoming an *I* proposition. It is true that 'Some students are not persevering' may be phrased thus:— 'The persevering students are a portion only of the student class' (see below under Quantification of the Predicate, §§ 662 seq.). But this is not a true conversion.

Mr. A. Sidgwick [2] speaks of 'the important and far-reaching law of Counter-indication'. If the presence of *S* indicates the presence of *P* (Every *S* is *P*), the absence of *P* indicates the absence of *S* (No not-*P* is *S*). And if the presence of *S* indicates the absence of *P* (No *S* is *P*), the presence of *P* indicates the absence of *S* (No *P* is *S*). We might add that if the absence of *S* indicates the presence of *P* (Every non-*S* is *P*), the absence of *P* indicates the presence of *S* (Every non-*P* is *S*). Also, if the absence of *S* indicates the absence of *P* (No non-*S* is *P*), the presence of *P* indicates the presence of *S* (No *P* is non-*S*).

§ 618. 'No news is good news' is an *A* proposition (Every non-*X* is *Y*). If it meant that the news which comes is never good news it would be *E* (No *X* is *Y*). 'Nothing venture, nothing have' may be regarded either as *A* or as *E* (Every non-*X* is non-*Y*, or No non-*X* is *Y*), according as the second negative is

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[1] *Fallacies*, cap. iv.

attached to the predicate or not. The first 'nothing' does not affect the point at all. Compare the 'non posse peccare maius est quam non peccare' of St. Thomas, where neither *non* affects the quality of the judgement (= Every non-X is Y).

'Vita sine litteris mors est' is of the A form ('All non-ZX is Y'). 'Omittance no quittance' is either A or E. 'He is all eyes and no sight' may be represented by 'X is non-ZY'. 'Good wine needs no bush' is a simple E proposition. The following are more complex universal negatives—'There is no living, none, if Bertram be away' (no non-ZX is Y). 'Can't be no other way but he must die' (the same). Similarly 'ubi non est sacerdos non est Ecclesia' (St. Jerome), and 'I am nothing if not critical'. 'No ZX is Y' represents such a judgement as 'Nothing comes amiss, so money comes withal'. 'Who gives not lives not' is 'no not-ZX (or no non-X) is Y'. The formula for 'A prophet (X) is not without honour (Y) save in his own country (Z)' will be 'No non-ZX is non-Y'. More simply, Every non-YX is Z— every unhonoured prophet must be looked for in his own country (i. e. and there only).

§ 619. The limiting word 'only' (μόνοι) attached to a subject, or 'the only' (οἱ μόνοι) attached to a predicate, both in affirmative and negative assertions, requires subject and predicate to change places in order that the proposition may be expressed in the ordinary logical form. Thus 'Only X is Y'. 'Only the sense matters' = 'The sense is the only thing that matters' = 'All that matters is the sense' (All Y is X). Yet the order is preserved if the proposition be expressed in E rather than in A form— 'Nothing but the sense matters' (No not-X is Y). 'Deus solus fruendus est, reliqua utenda' = 'All that is to be enjoyed is God' = 'Nothing that is not God is to be enjoyed'. Again, negatively, 'Not only X is Y.' 'Not only blows hurt' = 'Blows are not the only things that hurt' = 'Not all things that hurt are blows'. But this, which is an O, can be expressed as an I, proposition in the form, 'Some things which are not blows hurt' (Some non-X's are Y), which again preserves the original grammatical order.

On the other hand, 'only' *preceded* by the definite article or possessive pronoun marks the subject affirmatively, the predicate negatively. 'Phyllis is my only joy' = 'My only joy is Phyllis' = 'Only Phyllis is my joy' = 'All my joy is Phyllis' = 'Nothing but Phyllis is my joy'. 'Only the brave deserve the fair' =

'The only ones who deserve the fair are the brave' = 'All who deserve the fair are brave' = ' None but the brave deserve the fair'. Again, ' Phyllis is not my only joy' (or ' My only joy is not Phyllis') = 'Some joy of mine is not Phyllis' = 'Some not-Phyllis (something besides Phyllis) is my joy'.

'Alone' is equivalent to 'Only the'—' The brave alone,' &c. 'In him alone 'twas natural to please.' Compare the Latin *unus*—'hic unus servat fidem'; 'uni aequus virtuti.' But it stands for 'the only' rather than 'only the' in sentences like ' una salus miseris nullam sperare salutem'. 'Alone' also has the meaning of absence of associates—' He drank two bottles alone.' (See also below, § 690.)

'Only' has also a purely adverbial use (μόνον). 'Tears are only salt water.' This may be expressed in the singular, 'A tear is only salt water'; or particularly, 'Some tears are only salt water.' And negatively, 'Tears are not only salt water.' What is spoken of is the nature and composition of each individual of the class. It is nothing else than salt water. Such a use of ' only ' cannot always be easily distinguished from the other— e. g. 'We only meet to part'—each of our meetings is simply a parting; or, all our meetings are partings,—whenever we meet it is to part.

§ 620. In the above examples of implicated judgements is there any *illative process* ? There has been a change of expression, a shifting, perhaps, of the mind's attitude ; yet the meaning remains the same, or at least—in the case of the converted statement of *A*, and that of certain weakened implications—is part of, and contained in, the meaning of the original judgement. The logical connexion of the terms has not been modified. ' Nothing which is *X* is *Y*' and ' Nothing which is *Y* is *X*' are not merely rationally equivalent—for it might be urged that the conclusion of a syllogism is the rational equivalent of the combined premisses, but is nevertheless *inferred* from them—,[1] but are the same assertion, viewed from different standpoints. Nothing is both *X* and *Y*, both *Y* and *X*. Nothing being *X* is also *Y*. Nothing being *Y* is also *X*. No one combines the

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[1] I am hardly disposed to admit this ; for it is just the rational combination of the two premisses, and elimination of the middle term when it has done its work, in which the inferential *process* consists. There is nothing like this in so-called ' immediate inference '.

characters of bully and brave man. And similarly with particular judgements. Some persons are at one and the same time both knave and fool (*I*), both knave and wanting in wits (*O*). Where is the *processus mentis,* the advance in thought, from convertend to converse? It is objected that the same judgement cannot have two subjects. But the logical judgement can have varied grammatical expression. Are not ‘ Pictures brighten a room ’ and ‘ A room is brightened by pictures ’ the same judgement rationally? ‘ *He* did it ’, with an emphasis on ‘ he ’, is the same judgement in my mind as ‘ It is he who did it ’.

§ 621. Whatever difficulty exists arises about the converse *per accidens*, or, as it is called, ‘ by limitation,’ of *A*. ‘ Some *Y*’s are *X* ’, which is contradicted by *E*, is clearly only a part of what is asserted in ‘ All *X*’s are *Y* ’, which is contradicted by *O*. If ‘ All *X*’s are *Y* ’ meant ‘ Everything is at once *X* and *Y* ’, it would convert *simpliciter*. But it means ‘ Everything which is *X* is at once *X* and *Y* ’, or ‘ *Y* and *X* ’. The subject is hypothetical—‘ If anything is *X* ’—and does not stand on a level with the predicate. Only when we obvert ‘ Every *X* is *Y* ’ to ‘ Nothing which is *X* is not *Y* ’ do we obtain an equivalent converse, ‘ Nothing which is not *Y* is *X* ’ ; just as an *O* proposition, ‘ Some things which are *X* are not *Y*,’ can be expressed, ‘ Some things which are not *Y* are *X*.’

§ 622. But ‘ Some *Y*’s are *X* ’, implied in ‘ All *X*’s are *Y* ’, can only be regarded as obtained inferentially from that judgement if the axiom that the greater contains the less be considered as a mentally supplied major premiss. In which case the inference is mediate, not immediate. The same is the case with ‘ Three (at least) are dead ’ obtained from ‘ Five are dead ’, and with the judgement that a hole large enough for the cat to enter by is large enough for the kitten. Hamilton (ii. 269) calls ‘ inference of Subcontrariety ’ by the name ‘ Integration ’.

I have already argued (§§ 37 seq.) that the phrase ‘ Immediate Inference ’ is a contradiction in terms. It is admitted that all inference must have a ground. Every statement must have a sufficient reason. But it is urged that a ground or reason is not necessarily a middle term. The original proposition is itself the ground for the one based on it. Having made a statement we are entitled, in virtue of that statement, to proceed to another, just as in mediate inference, having made two statements con-

nected by a middle term, we are entitled, in virtue of those statements, to proceed to a third.

§ 623. I submit, however, that the two cases are not alike. A pair of premisses, united by a middle term, usually called the ground, present in combination a rational character, and contain an energy bound to issue in inference, in obedience to an ultimate law of Reason, examined in the earlier part of this book. But a simple judgement has in itself no rational character. It is merely intellective. Not wedded to another, it remains unproductive. If another judgement professes to have been inferred from it, the challenge, By what law? claims an answer. In the case of a conclusion from premisses, there is no difficulty about assigning the law of the process. 'Syllogistic reasoning,' says Whately, 'is in truth all reasoning.' [1]

Not admitting Conversion to be illative, neither can we ascribe that character to Obversion. E. g. 'No X is not Y' (It never rains but it pours) is not an inference from 'Every X is Y' (Whenever it rains it pours), but the same logical judgement.

§ 624. To return to the implication of judgements. The bearing of the doctrine of Quantified Predicate on the conversion of A will be considered later (§ 672). If, however, we complete and fill up the predicate of a universal affirmative, All X's are Y, by annexing to it the subject as qualifying difference, All X's are XY, predicate and subject become identical in extension. 'All whales are mammals' means all whales are whale-mammals, form the cetacean section of the mammal class. But not 'are mammal whales'; for Y is at least as large a class as X, and cannot determine it as differentia. Yet if the subject have a qualifying and a substantival element, the latter is the substantival element of the predicate also. 'A penny saved is gained'—a penny saved is a penny gained. Boiled turkey is spoiled turkey. The predicate has a wider extension, presumably, than the subject, though 'turkey spoiled' is narrower than 'turkey' alone. Compare, 'The word of the Lord is a pure word'; 'A vote given to my antagonists is a vote given to the enemies of England.' See above, § 488.

§ 625. On the other hand, it is immaterial whether we say 'Some X's are XY', or 'Some X's are YX'—'Some kings are royal sages', or 'Some kings are philosopher kings'. It is

[1] *Logic*, Introduction.

immaterial whether we say 'No X's are XY', or 'No X's are YX'—'No women are female voters', or 'No women are vote-possessing females'.

§ 626. Using the language of Predicables, in I judgements either X or Y may difference the other; in O judgements either X or not-Y; in E judgements neither. I and E are therefore convertible simply; O after obversion only. In A judgements, Y is genus to X, unless it chance that they coincide in extension. According 'All X's are Y' converts in the form 'Some Y's (at least) are X'.

§ 627. The following Diagrams will exhibit to the eye the Implication of Judgements. The darker portions show the quantification of X, whether in convertend or converse.[1]

A

Every X is Y. Some Y's (at least) are X. No X's are not Y, &c.

or
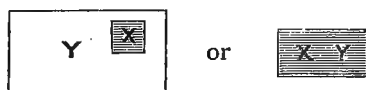
This is contradicted by

O

Some X's are not Y. Some not-Y's are X.

or
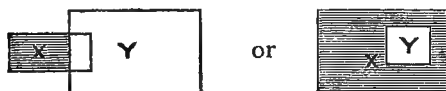
E

No X's are Y. No Y's are X. All X's are not-Y, &c.

[1] I do not mean that 'Some Y's are all X's' is a possible judgement (see below, under Quantification of the Predicate); but only that, having been *given* the number of X's that are Y, we know, when we conversely include a portion of the Y class among the X's, how many X's we happen to be speaking about.

This is contradicted by
I
Some *X*'s are *Y*.   Some *Y*'s (at least) are *X*.
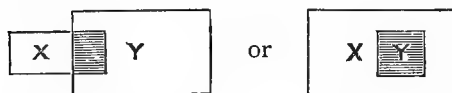
I and *O*, being compatible with one another, have the same diagrams, with the darker parts reversed.   *A* and *E*, being contraries, are entirely dissimilar.   In *A*, *X* is wholly included in *Y*.   In *E*, *X* is wholly excluded from *Y*.   In *I*, *X* is partially included in, and in *O*, *X* is partially excluded from, the sphere of *Y*.

I have preferred to employ rectilinear diagrams instead of the usual circles; for, if the two classes *X* and *Y* chance to make up together the entire extension of *Z* (as male and female are all human beings), this cannot be shown by circles, though it might be shown by segments of circles.

§ 628. If *A* is true, *I* is true, *E* is false and *O* is false.
If *A* is false, *I* is doubtful, *E* is doubtful, *O* is true.
If *E* is true, *O* is true, *A* is false and *I* is false.
If *E* is false, *O* is doubtful, *A* is doubtful, *I* is true.
If *I* is true, *A* is doubtful, *E* is false, *O* is doubtful.
If *I* is false, *A* is false, *E* is true and *O* is true.
If *O* is true, *E* is doubtful, *A* is false, *I* is doubtful.
If *O* is false, *E* is false, *A* is true and *I* is true.

In a complex proposition we argue from the truth of an antecedent to the truth of its consequent, and from the falsity of a consequent to the falsity of its antecedent.   If *M* is *N*, *X* is *Y*; *M* is *N*, then *X* is *Y*; *X* is not *Y*, then *M* is not *N*.   But in the above implication of judgements it has been erroneously asserted that we argue from the truth of an antecedent to the falsity of a consequent, and from the falsity of an antecedent to the truth of a consequent.   E. g. if *A* be true, *O* is false ; and if *A* be false, *O* is true.   But it is not *A* and *O* (for example) that are antecedent and consequent respectively, but the parts of the statement about their relations ; viz. if *A* be true (antecedent), *O* is false (consequent).   We proceed to argue—*A is* true (it is true that *A* is true).   Then *O* is false (it is true that *O* is false).   *O*

is *not* false (it is false that *O* is false). Then *A* is not true (it is false that *A* is true).

§ 629. For the Opposition of Singular Judgements, in which Contrary and Contradictory appear to be identical, see above, § 143 seq. The earth is flat; the earth is not flat. Brutus killed Caesar; Brutus did not kill Caesar. Freedom shrieked when Kosciusko fell; Freedom did nothing of the kind. Yet where any question of degree can enter, the ordinary forms of Opposition reappear. E. g. 'The earth is not altogether flat'. This is an *O* proposition, contradicting *A*, 'The earth is (altogether) flat.' 'This egg is not good. Yes; it is good in parts.'

§ 630. We have seen that 'Every *X* is *Y*' implies that every non-*Y* is non-*X* (contrapositive implication), but yields no general proposition about non-*X* or about *Y*.

This is the most summary form of the doctrine that the falsity of a consequent carries with it the falsity of the antecedent, but that the truth of the consequent allows us to infer nothing about the antecedent, and the falsity of the antecedent allows us to infer nothing about the consequent. For though in metaphysics 'sublata causa tollitur et effectus,' the effect only disappears as an effect of that particular cause, but may still be found as a phenomenon, seeing that phenomena may have more causes than one.

Yet 'Every *X* is *Y*' yields the implicated propositions, 'Some *Y*'s are *X*' and 'Some non-*X*'s are non-*Y*'. This is as much as to say that, where a consequent is found true, this sometimes implies the truth of the antecedent, and that if an antecedent is falsified there is *to that extent* a greater possibility of the consequent not being found true.

§ 631. An *A* proposition may be expanded in the conjunctive form—If *A* is *B*, *C* is (always) *D*.

An *I* proposition expands in the form—If *A* is *B*, *C* is sometimes *D*.

An *E* proposition thus—If *A* is *B*, *C* is not (never) *D*.

An *O* proposition thus—If *A* is *B*, *C* is sometimes not *D*.
Now from *A* we can go on—'If *C* is not *D*, *A* is not *B*'. But from *E* the assertion that *C* is not *D* yields no further judgement. The denial of the consequent is here '*C is D*'. From *I* we get, 'If *C* is *D*, *A* is sometimes *B*,' and from *O*, 'If *C* is not *D*, *A* is sometimes *B*.'

The denial of *A* being *B* affords no result in either *A*, *E*, *I* or *O*.

The antecedent, of course, might have been, 'If *A* is not *B*,' and the consequent, '*C* is not *D*.'

§ 632. In the above expansions, *I* and *O* deny any necessary causal connexion or invariable sequence. The antecedent 'If *A* is *B*' becomes then in meaning concessive rather than hypothetical. Even if *A* be *B* it does not follow that *C* is never *D*, that *C* is always *D*.

§ 633. The signs of quantity (*always, not always, never, sometimes*) do not qualify in each case the consequent in itself, but the consequence, the *nexus*. Thus, if *A* is *B* it *may* happen that *C* is *D*—not, it *must* happen that *C* may be *D*. E. g. 'If persons are injured sometimes the law can do nothing for them'. Yet the 'sometimes' (or other mark of quantity) will occasionally be merged in antecedent or consequent. E. g. 'If a man becomes a judge he is sure sometimes to make mistakes'. 'If a clock never goes, it is useless.'

§ 634. One more case of Implicated Propositions arises in what are called Added Determinants. In these, a proposition being granted, it is assumed that a new qualification of the subject involves a similar qualification of the predicate. If a watch is a piece of mechanism, a watch that will not go is a piece of mechanism that will not go. If James is a seaman, James's uncle is a seaman's uncle (has a nephew who is a seaman).

This is on the principle that any qualifying or determining element in the subject of a proposition reappears, actually or tacitly, as a similar element of the predicate. Thus, beef is food; then boiled beef is food, viz. boiled food.

§ 635. But care must be taken that the added determinant has an absolute and not a relative significance. Horseflesh is food; but it does not follow that the best horseflesh is the best food. The oldest clergyman is not necessarily the oldest human being, nor a big frog a big animal.

Again, even when the determinant has an absolute meaning, it can only be safely added to a universal judgement. If some men are Europeans, we cannot proceed to say that some black men are black Europeans; though it would accidentally be true that some deaf men are deaf Europeans.

Diagrams, which the student can draw for himself, would at once make it obvious that, in the case of a universal judgement, the subject, however qualified and differenced, falls entirely within, or entirely without, the sphere of the predicate. But that in the case of a particular judgement we cannot be sure that this is so.

§ 636. 'Complex Conception' is somewhat similar to Added Determination. But on neither—in spite of the textbooks—can an 'immediate inference' be founded.

CHAPTER XX

EXTENSION AND INTENSION

§ 637. The Conversion of Propositions raises two matters for discussion. One is Extension and Intension in predication. The other is the Quantification of the Predicate.

In converting propositions we seem hitherto to have viewed them as regards their Extension only—transferring the quantitative sign from the subject of the convertend to its predicate.

§ 638. The extension of the predicate Y or not-Y must rationally be at least as broad as that of the subject X. 'Quotquot Z sunt X tot sunt Y.' And the Y's which coincide with the X's are not merely equal in number to them (so that if the twenty-two cricketers dine together the diners number at least twenty-two) but identical with them. A proposition is not an equation.

§ 639. It must be borne in mind, however, that expressions like *all, some only, most, half, all but four*, are relative. If all or most or a half of the X's are Y, it does not follow that the sphere of the predicate covers all, most, or a half of the Y's. Yet any absolute numerical determination of the subject, from nought upwards, will govern the predicate also.

§ 640. 'Every X is Y' implies that only Y's, only things which are Y, are X. It does not imply that only Y-ness is to be attributed to the X's. They have other attributes, such as Z-ness. If every X, then, is Z, only things which are Z are X. It follows that the spheres Y and Z are at least partially co-extensive. If all Cretans are liars, and all Cretans are seafaring men, then (granting the existence of Cretans) some liars are seafaring men and some seafaring men are liars, although the two connotations, seafaring and lying, have nothing in common.

Even if the extensions of subject and predicate happen to coincide, the attributes connoted are not, except in definitions, the

same, though they may be causally inseparable. All equilateral triangles are equiangular; but having equal sides is not the same thing as having equal angles.

§ 641. Prior to quantification, the subject concept in a general, or abstract universal, affirmative proposition cannot have a wider extension than the predicate—there cannot be more men than mortals; on the other hand, in a negative or particular judgement there is nothing to show which of the two concepts is the larger. Horses are not cows. Some horses are affectionate. Some horses are not affectionate. We cannot, comparing horses with cows, with affectionate, or with non-affectionate, creatures, determine in each case which is the bigger class. But in a concrete-universal judgement—'All my camels, all the five camels, are stolen'—, while we have no *data* for comparing the extensions of 'camel' and 'stolen', 'my camels,' 'the five camels' must be fewer, or at least not more in number, than stolen things.

§ 642. Only, let the caution be again observed, that so far as the two concepts are united in predication, the classes do not merely overlap but are *identified*. As Dr. Bradley says, ' Hope is dead' does not mean that in hope and a fraction of dead things there is exactly the same sum of units.[1] They are identical.

If some men are negroes, some negroes are men, and the 'some' stands in both cases not only for the same number but for the same individuals. There could not be one hundred million of men negroes, and another hundred million of negroes men.

§ 643. We have now to ask what is the effect on the conversion of judgements of viewing them not in Extension but in Intension, not quantitatively but qualitatively.

Hamilton considered that the intensive force of propositions had been 'marvellously overlooked' by logicians.[2] Undoubtedly,

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[1] *Logic*, p. 24.

[2] 'If the reasoning under either of these two quantities were to be omitted, it ought, perhaps, to have been the one which the logicians have exclusively cultivated. For the quantity of extension is a creation of the mind itself, and only created through, as abstracted from, the quantity of comprehension; whereas the quantity of comprehension is at once given in the very nature of things. The former quantity is thus secondary and factitious, the latter primary and natural' (*Lectures on Logic*, i. 217, 218). On the other hand, a synthetic judgement can be stated as a relation between classes, but not as the relation of one

to say that a subject is contained in a certain class is to say that whatever has the attributes connoted by the subject has the attributes connoted by the predicate expression. And conversely, possession of the predicated attribute or attributes sometimes at least carries with it possession of the attribute or attributes of the subject expression. That is, if everything qualified by X-ness has the attribute of Y-ness (every X is Y), some at least of the objects possessing Y-ness have necessarily the quality of X-ness—that is, if any objects have it.

§ 644. But, equally, the attribution of a quality to any object implies that that object is part of, or a member of, a class whose extent may or may not be ascertained, of objects characterized by that quality. Conceivably there may be but a single object so characterized. The class consists of one. Yet an extension consisting of one object is still an extension and not an intension. E. g. 'Joshua captured Jericho without a blow'.

§ 645. It seems plain, then, that all predication is simultaneously in extension and in intension (see above, §§ 189 seq.). 'London is a big city' ranks London among big cities, and at the same time describes its character. 'Big city' connotes a quality. Yet 'a' (= one) is numerical. No doubt, Extension rests on Intension rather than Intension on Extension.[1] A rower is one who rows. Yet some have held that language began with proper names—chance designations of individual objects —which were afterwards extended to similar objects, and so acquired a connotation.[2] The process still goes on to some extent, proper names becoming common nouns and verbs—e.g. pandar, hansom, sally-lunn, jeremiad, maudlin, bowdlerize,

connotation to another—this is the import of the analytic judgement ; or it expresses the relation of a connoted attribute to a class. 'Blessed are ye poor'—blessedness is attributable to you who are poor.

[1] 'A concept cannot denote unless it first of all indicate [this word should surely be reserved for pointing to objects], or connote. So that connotation is the ground of denotation. . . . The attributes in the comprehension of a concept are fixed ; they do not vary. But the species, classes, or individuals contained within the extension vary according to our principle of division' (Veitch, *Institutes*, p. 100).

[2] Jevons ascribes to proper names a maximum of intension, refusing to distinguish them from names of singular objects. E.g. 'My mother'; 'The earth's centre'; 'The victor of Austerlitz.' Such names 'indicate content as such, but content that is in its nature unique'. But see Bosanquet, i. 50.

macadamize, macchiavellian, quixotic, thrasonical, orrery, out-herod Herod. Not all names of individuals are so connotative as the Puritan 'Obadiah Bind-their-kings-in-chains-and-their-nobles-with-links-of-iron' or 'Hew-Agag-in-pieces-before-the-Lord'. But ancient proper names had usually some significance —Rufus, Redgauntlet, Deerslayer, or Scriptural names.

§ 646. So far it is not easy to see what 'discovery' lay in Hamilton's contention, though no doubt the traditional statement of propositions and syllogisms was couched too exclusively in extensional shape. And this in spite of the essentially qualitative character of the Aristotelian reasoning, ever seeking for the one in the many, for the form or cause which alone, and not empirical quantitativeness, determines the validity and scientific cogency of an argument. Moreover, in ordinary talk class-reference is less usual than the ascription of an action or quality. 'The blind man beat the dog' only remotely suggests inclusion in a category of dog-beaters. No one on hearing that nature abhors a vacuum calls up a picture of a class of vacuum-abhorring objects, and then places nature among them.

§ 647. It is as opening out an order of inverted reasoning that Hamilton laid most emphasis on the intensive aspect of predication. Either subject or predicate may be viewed as a containing whole,[1] and

'it is manifestly a matter of indifference, in so far as the meaning is concerned, whether we view *the subject as the whole of comprehension* which contains *the predicate, or the predicate as the whole of extension* which contains the subject. . . . The copula *is, est*, &c., equally denotes the one form of relation or the other. Thus, in the proposition *man is two-legged*, the copula here is convertible with *comprehends* or *contains in it*; for the proposition means, *man contains two-legged*. That is, the subject *man*, as an intensive whole or complex notion, comprehends as a part the predicate *two-legged*. Again, in the proposition *man*

[1] See below, §§ 821 seq. 'That there are two logical wholes, and consequently two grand forms of reasoning and not one alone, as all logicians have hitherto taught, I shall endeavour to convince you' (*Lectures on Logic*, i. 262). However, he inclines to think that Aristotle's doctrine 'has reference indifferently to both' (p. 219). Mill rejects the 'discovery' as 'an excrescence and encumbrance', a 'mere superfoetation on Logic', 'requiring the ground to be gone over twice, with a perpetual struggle to express all the fundamental principles of reasoning in a manner combining both points of view' (*On Hamilton*, p. 508).

is a biped the copula corresponds to *contained under*; for this proposition is tantamount to, *man is contained under biped.* That is, the predicate *biped*, as an extensive whole or class, contains under it as a part the class *man.*'

§ 648. Hamilton is here again misled by his doctrine that judgement is a comparison of two notions or ideas, and not rather of a thing with a notion. Conceivably two-leggedness may be part of the definition of man; but directly we leave the established hierarchy of concepts, with their analytical implications, notional inclusion is certainly not the import of the proposition. Is there no difference between 'The flagship is the *Victory*' and 'The flagship is the vessel on which the Admiral hoists his pennon'? If lions are said to lack and suffer hunger, or bows and arrows to be antiquated weapons, or millers to wear white hats and have broad thumbs, how is the predicate comprehended in the subject as an intensive whole? The brave, we say, are modest, and princes are punctual. But modesty is not part of the idea of valour, nor punctuality of that of princehood. Cracking nuts may possibly be part of the concept squirrel, for squirrels are rodents; but not running up trees. Veitch illustrates his master's teaching by a quasi-analytic judgement—'The river runs'.[1] But Hamilton goes so far as to say that in 'Caius is a man' 'The term Caius contains in it the term man'. If it does, the proposition is a feeble truism—scarcely deserving the name of analytic—, and in that case is no type of the ordinary synthetic judgement.

§ 649. How would Hamilton bring Particular Judgements under the idea of notional inclusion—'Some women are badly-dressed'; 'Two passers-by were killed'; 'A riot is taking place', and the like? If the predicate were notionally comprehended in the subject, the judgements would be universal. And how would he deal with judgements in which a 'nevertheless' is understood—such as 'Some women are very tall' or 'Many rogues have a conscience'?

§ 650. Accordingly, even if 'is' could mean 'contains'— Hamilton elsewhere makes all predication, even when in Com-

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[1] *Institutes of Logic*, p. 225. '*Running*,' he says, 'is part of the whole concept of *river*. This is the relation of whole and part in thought, as much as the relation in extension of the subject to the predicate as a whole. Why then should Logic neglect this?'

prehension, to be *equative*, Comprehension or Intension being defined by him as Internal Quantity [1]—, the converse of ' X is Y ' could not, except in analytic judgements, be ' Y-ness is contained in X-ness'. Nor is this in logic, whatever it be in grammar, a conversion at all, any more than 'Boys are troublesome' has for converse 'Troublesomeness is a characteristic of boys'. In fact—since the converses of A, I and O propositions are all particular—the only kind of judgement in which 'intensive' conversion is possible is the analytic E judgement. Thus ' Kings are not subjects'—the idea of being a king excludes the idea of being a subject, which converts into 'the idea of being a subject excludes the idea of being a king'.

In the affirmative analytic judgement, in which the subject and predicate are respectively species and genus, the subject as to part of its intension is equivalent to the predicate ; and the predicate as to part of its extension is equivalent to the subject. But, as it is not an extensive conversion to say 'Part of the class Y is equivalent to X, and X is part of the class Y', so neither is it an intensive conversion to say 'Part of the idea of X-ness is equivalent to Y-ness, and Y-ness includes the idea of X-ness'. These are in either case one and the same judgement, not even looked at from different standpoints. It is all one to say 'The notion of sovereign power includes that of incapacity to commit any legal wrong', and 'Incapacity to commit any legal wrong is included in that of sovereign power'. If a pony is a small horse, pony *minus* smallness = horse, and horse *plus* smallness = pony.[2] But these propositions are not convertend and converse.

§ 651. Similarly with the ordinary synthetic judgement. ' X belongs to the class Y ' has not for converse ' Y-ness is always found among the properties of things which possess X-ness.' These are the same judgement viewed in extension and in intension. The real conversion (of A) is between, ' Y-ness is

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[1] Op. cit. i. 142, 144.

[2] Species—differentia = genus, and genus + differentia = species. This is true of intension, not, of course, of extension, since differentia does not augment but diminish the sphere of the genus which it qualifies. As based on conceptual abstraction, the genus gives only a partial and incomplete idea of the species, and the notion only a partial and incomplete idea of the nature of any individual. The differencing points must be omitted in what is general.

always found among the properties of things that possess
X-ness,' and '*X*-ness is sometimes found among the properties
of things that possess *Y*-ness '.

§ 652. There are four possible ways of stating a proposition ;
viz. (1) both subject and predicate in extension ; (2) both subject
and predicate in intension ; (3) subject in extension and predicate
in intension ; (4) subject in intension and predicate in extension.
Yet it is often difficult to make any distinction. The mind
necessarily intends both, though the one may be more promi-
nent in thought than the other. Mill remarks :—' When I say
the sky is blue, my whole meaning is that the sky has that
particular colour. I am not thinking of the class blue, as
regards extension at all. I am not caring, nor necessarily
knowing, what blue things there are, or if there is any blue
thing except the sky. I am thinking only of the sensation of
blue.'[1] This is a better illustration than his other one, 'All
oxen ruminate,' for the speaker might very well be meaning to
class oxen with ruminant animals. Even in describing the sky
as blue, a scene-painter might be mentally ticketing it as one of
the objects for which he would require a particular pot. And
in any case the name 'blue' implies a comparison of existing
things agreeing in that colour.[2] Intension, it must be repeated,
does not stand for attribute, but for *possessing* attribute. All
that can be said is that the subject of a judgement is thought
primarily in extension, for it is reality qualified thus and thus of
which we assert anything ; and we do not usually ascribe attri-
butes to attributes[3] but to the possessors of attributes. On the

[1] *On Hamilton*, pp. 497, 498.

[2] On the other hand, a complex conception need not have been
experienced so long as its elements recall familiar things. It was not
necessary to compare a number of different people having blue beards
before getting the idea of *barbe-bleue*.

[3] Yet an attribute can stand as subject, e. g. ' Slowness in a horse is
undesirable '; or (analytically) ' Slowness excludes hurry '. St. Paul has
a chapter on the characteristics of Charity. Sidgwick (*Use of Words*,
p. 254) accuses Mill of departing from his own account of the nature of
connotation when he says that an attribute may sometimes be said to
have attributes. But a name need not be ' connotative ' for that which it
designates to have attributes. Individual objects have attributes. An
abstract name is the name of a connotation ; yet it is not itself connotative
but notative. McCosh says : ' Abstract Notions have Comprehension,
for they embrace qualities ' (*Discursive Thought*, p. 12). Untidiness,

other hand what is ascribed to them is not things but qualities, and so the predicate is primarily thought in intension. Yet this necessarily involves inclusion in an actual or potential class.

§ 653. Such inclusion is sometimes directly expressed. For example—

Fies nobilium tu quoque fontium.
I guessed you one of those Who eat in Arthur's hall.
Iubes esse in amicorum numero.
Divitiae numerantur in bonis.
In the catalogue you go for men.
Sum ex libris.
Aramis was one of the Three Musqueteers.
He is in the school Eleven ; in the Grenadiers.
He is one of six.
Lust and envy are two of the darkest sins.
He belongs to the criminal class.

And every proposition, in fine, of which the predicate is a noun substantive—'Plain-dealing is a jewel'; 'Pickpockets are criminals.'

A predicate, again, may be an individual, a numerical totality, or an abstraction. 'Attila was the Scourge of God,' 'L'Empire c'est la paix,' 'laborare est orare,' 'Omission is prohibition,' 'Possession is nine points of the law,' 'We are seven,' 'Love is to be all made of fantasy,' 'I am Cinna the poet, not Cinna the conspirator,' 'This crust is all I have.'

§ 654. The expressions major and minor term imply container and contained, but in extension only.

§ 655. An adjectival predicate primarily expresses intension, yet an adjective is incomplete without a substantive. Number has the peculiarity of being adjectival, and yet of connoting extension. In 'the five virgins' and 'the foolish virgins', 'five' and 'foolish' are not similar qualifications. For each of the virgins was foolish, but each was not five. We say, 'three blind mice'; but a blind mouse is not a three mouse.[1] Number,

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however, does not *imply* any quality; it *is* a quality. In the text 'ascribe to' means, of course, 'predicate of.' Attributes of a predicate are often *ascribed to* those of the subject as effect to cause. London eggs are indifferent because they are characterized by staleness.

[1] Bosanquet says: 'In the proper name there is still the semblance or fiction of a general Intension. In the number even this fiction has

therefore, as a predicate, must, in converting, be regarded as a totality. 'Thy servants are twelve men'—a body of twelve men constitutes thy servants.

§ 656. The variety of grammatical forms in which predicates can be expressed is the only interest, as I imagine, possessed for pure Logic by the famous Categories, or to use their Latin name, Predicaments.

As attribution necessarily implies an extended subject, so everything about which we speak must always be conceived as possessing intensive attributes or activities. A subject has to be regarded under some aspect. The concrete is only known by being brought under the general. The sensible individual and the cogitable universal come into explicit existence in thought together. Now Aristotle, with the Nominalists, denies the separate and prior existence, *ante rem* and *extra rem*, of the universal thus predicated, and regards it in his doctrine of Categories as a mere predicate, having but an *adjective* being. And, without deciding any metaphysical question, this must be the way in which the mere logician regards it. Only, we have so far considered the ultimate subject of predication to be not, as Aristotle holds, the particular sensible, τόδε τι, but Reality determined in this way or that. To Reality thus determined we attribute in judgement a further determination.

§ 657. For us, then, the Predicaments have only a grammatical significance ; and, if we were considering Thought apart from Language, we might pass them by altogether. They are arrived at by breaking up propositions, and observing how many grammatical shapes predication can take. The predicate is not considered subjectively in relation to the subject (as genus, property, accident), nor objectively in relation to the 'copula' (as inherence or result, answering to the nature of the subject as *causa immanens* or *causa transiens*), but in itself, ἄνευ συμπλοκῆς, apart from assertion, yet as capable of being asserted. We have therefore no concern with 'syncategorematic' parts of speech, such as preposition, article, or most adverbs, which can only be predicated in connexion with categorematic parts of speech.

disappeared, and nothing remains but the place of the particular in an aggregate of particulars, united solely by a common denomination' (*Logic*, i. 50).

§ 658. Aristotle, it is true, can hardly have regarded his scheme as simply 'an enumeration of the different grammatical forms of the possible predicates of a proposition', for Grammar was practically as yet unborn ; and, moreover, to a Greek there was an intimate union between forms of words and the reality of things.[1] Names expressed the various modes of Being's manifestation. Yet the Aristotelian Categories do roughly answer to ten principal grammatical forms capable of standing as predicates. The predicate can be a substantive (i.e. 'second substance', regarded as genus, &c.; e.g. 'Lions are cats'). This is Aristotle's οὐσία, answering the question τί ἐστι; It can be an adjective of quantity (answering the question πόσον;) ; of quality (ποῖον;) ; or of comparison (πρὸς τί;). It can be an adverb of place (answering the question ποῦ;) ; or of time (πότε;). It can also be a verb, either neuter (κεῖσθαι), or middle (ἔχειν), or active (ποιεῖν), or passive (πάσχειν). But the significance of κεῖσθαι and ἔχειν is disputable.

§ 659. Adverbs of time seem to be quasi-categorematic like those of place—'Mon pays est là où je prie le mieux'; ' It was two years ago.' No doubt, adverbs can only stand as predicates when capable of being expanded in an adjectival form. ' Hinc illae lacrimae ',—those tears are (things which come) from hence. The motto of the Earls of Ellesmere is ' Sic donec '—which has been paraphrased, ' Bridgewater House will do till I reach the celestial mansions.' A sentence may be expressed in a single adverb—'Softly,' ' Gently,' 'Up ! he cried.' In 'Plutôt mourir que de changer' ' plutôt' is rhetorically concise.

[1] According to Bacon, Aristotle 'constructed the world out of his Categories '. The Rev. Mr. Grundy (*Aristotelianism*, p. 113) observes : ' That the Categories were metaphysical or ontological is true, in the modern acceptance of the terms, but not so according to the conception of Aristotle. They denoted real existence, however closely they were connected with the thought and its expression, but real existence in its *varieties of manifestation*; while the Aristotelian metaphysics are occupied with existence *as a whole*. Yet the *Metaphysics*, perhaps the latest of Aristotle's works, presuppose the logical treatises, and expressly refer back to them (iii. 3). . . . The interest which attaches to nine of the Categories is antiquarian. One and all, except the first, mark the outlines of a coast which has shifted, so as to be no longer recognizable. But those waves of thought which have swept away the old landmarks still beat restlessly about the adamantine barrier which shuts in the mystery of existence.'

§ 660. It must be confessed, however, that the Aristotelian Categories are chiefly interesting, after all, to the metaphysician, and help us very little in sorting the immense variety of idiomatic phrases and syntactical collocations by which predication is actually expressed in language.   Here are a few samples :—

Like people like priest.

Ecce Homo.

Away with such a fellow from the earth !

The way to heaven is by weeping-cross.

Comes iucundus in via pro vehiculo est.

Sic itur ad astra.

Throw dirt enough and some will stick.

Woe unto thee, Chorazin.

Il faut aimer les choses divines pour les connoître.

Safe bind safe find.

Ne iudicate ne iudicemini.

It is seven miles to London.

To horse ! Ad arma !

Plus je me sens français, plus je me sens humain.

Two Czars are one too many for a state (Dryden).

Clever men are as common as blackberries ; the difficulty is to find a good one (Huxley).

Il faut si peu à l'homme et pour si peu de temps.

Mos pro lege.

LXX is 70.

The chariots of God are twenty thousand.

Ubi aves ibi angeli.

§ 661. The practical difficulty of converting some of these propositions affords good exercise.   For example, ' Throw dirt enough and some will stick ' converts to ' One case at least of some dirt sticking is when you throw enough of it '.   ' Ubi aves ibi angeli ' becomes ' Birds are sometimes where angels are '. The line from Dryden becomes ' One case of there being one Czar too many for a state is when there are two '.   ' To horse !' becomes something like this :—' One occasion for bidding you mount is now.'   ' Judge not, that ye be not judged ' means ' Your not judging others is an invariable condition of not being judged '; which converts thus :—' One condition of your not being judged is not judging others.'   If a cavil be raised that imperatives are not propositions, we answer that this is only

true grammatically. From the point of view of Logic every enunciation is categorical, and can become a major or minor premiss. 'Go!' means 'You are to go', *eundum est.* The only exception is interrogations, which are either a suspended assertion—'Tu m'aimes, n'est-ce pas?', 'Thou lovest me?'—or an incomplete assertion, leaving a blank, as it were, to be filled up by the person questioned—'When did you come?' 'You came—when?' 'The time at which you came was —?' Until these *dicta* in the air come down to earth, and become assertive, they are only notional, and so cannot stand as premisses. But many questions indicate the expected reply, and therefore acquire various degrees of assertiveness, e.g. 'What is the use of writing?' 'Where are the snows of yester year?' 'Will you not come?'

An Interjection is usually said to be not λόγος but φωνή. But, regarded logically, exclamations like 'Ah!' 'Fie!' 'Alas!' 'Fudge!', 'Dear me!', and the like, are judgements and may be expanded into propositions.

CHAPTER XXI

QUANTIFICATION OF THE PREDICATE

§ 662. This is another question which arises under the head of Propositional Implication.

It is certainly remarkable that, after censuring previous logicians for having 'marvellously overlooked the reasoning in Comprehension', Hamilton should have proposed a second reform in the process of reasoning which, by reducing the judging act to an equivalence of singulars or aggregates, ignores Comprehension altogether.[1]

§ 663. 'The common doctrine,' he observes, 'remounting to Aristotle, takes into view only the subject, and regulates the quantity of the proposition exclusively by the quantity of that term.' This comes of 'an incomplete analysis, resulting in confusion and multiplicity'.[2] 'The New Analytic is intended to complete and simplify the old,—to place the keystone in the Aristotelian arch.'[3] The quantity, not only of subject but also of predicate, is 'always understood in thought', and it is a 'simple logical postulate, *to state explicitly what is thought implicitly*'. 'The preindesignate terms of a proposition, whether subject or predicate, are never on that account thought as *indefinite* (or indeterminate) in quantity.'[4]

§ 664. Hamilton continues :—

'The whole doctrine of the non-quantification of the predicate is only another example of the passive sequacity of the logicians.

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[1] 'All judgement,' writes Hamilton, 'and consequently all reasoning is simply an equation of its terms, and *the difference of subject and predicate is purely arbitrary*' (*Lectures on Logic*, ii. 298). Again: 'A proposition is simply an equation, an identification, a bringing into congruence, of two notions in respect of their Extension; for it is this quantity alone which admits of amplification or restriction, the Comprehension of a notion remaining always the same, being always taken at its full amount' (ibid. p. 271). So that 'Both my sons are at home' imports an equation or identification (but identification is not equation) between my sons and two objects which are at home.

[2] Ibid. p. 244.　　　　[3] Ibid. p. 249.　　　　[4] Ibid. p. 250.

.They follow obediently in the steps of their great master. We owe this doctrine and its prevalence to the precept and authority of Aristotle. He prohibits once and again the annexation of the universal predesignation to the predicate.'[1]

§ 665. Some logicians at the end of the scholastic period played with quantifying of predicates, and Hamilton allows that the ancients who rejected the idea placed it distinctly before their minds. He himself became convinced of its truth in 1833, and proclaimed it as 'the new doctrine' which is 'to reconcile the science of Logic with truth and nature'.[2] His followers have hailed it as a 'discovery', which, 'whether competent logicians accept all its details or not, has certainly modified all logical doctrine since its promulgation.' Bentham, however, has also been claimed as its pioneer; and another school of predicate-quantifiers was headed by De Morgan.[3]

§ 666. To Mill the new Analytic seemed a 'psychological irrelevancy'. Grote is severe on 'these useless ceremonial reforms', 'troublesome and unprofitable.' More recently, Mr. J. N. Keynes, in his *Studies and Exercises in Formal Logic* (p. 293), writes :—'It is clear that in the Hamiltonian doctrine there is a want of internal consistency. The doctrine is essentially of an unscientific character.' Even more decisive against Hamilton than the opinions of students is the *communis sensus* of mankind as embodied in the facts of language. He says himself :—'A logic which cannot be unambiguously expressed in language is no logic at all. Logic, Language and Common

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[1] Op. cit. p. 262. The reference to Aristotle is *De Interpr.* c. vii and c. x.

[2] Ibid. pp. 251, 298.

[3] While Hamilton claimed that his system was that of Aristotle fully developed, De Morgan declared that his had little in common with the old one. He claimed to have 'opened to Logic an indefinite field for improvement'. Hamilton, however, in his *Discussions* (pp. 707, 708) attacked 'the confident blindness with which a mathematical author can treat a logical subject', through not considering that 'mathematics are not a road of any kind to Logic', but are likely to 'ruin the reasoning habits of their votary'. De Morgan, on the other hand, asserted in the *Quarterly Review* that 'Sir William Hamilton has invented *cumular* expressions which do not suit the genius of common thought or common language'. His own 'Exemplar system' (e. g. 'Any one X is any one Y' $= X$ is Y—there being only one of each) is in turn denounced by Hamilton as satisfying neither sense nor English.

Sense are never at variance.'[1]   He asserts, however, that 'the objection that such quantification would be useless and superfluous, disorderly, nay confusive, only manifests the limited and one-sided view of the objectors, even though Aristotle be at their head '.

§ 667. Hamilton's co-editor, Professor Veitch, observes :—

'The express quantification of the predicate follows as a necessity from the very nature of predication in extension.   The predicate in extension indicates a class.   Affirmative predication is the reference of the subject to the class.   It must have *some* place in the class—*some at least.*   Why, then, not designate the extent in which I mean the predicate term to be taken?   Again, I may know and mean that the place of the subject in the class is that it occupies the whole of it.   I say, *all trilateral is triangular*—meaning *all triangular.*   Why not, even to avoid ambiguity, express this ? . . . . Hamilton's procedure is in no way a departure from logical method or principle.   It is simply a demand that what is understood in thought should not remain implicit or understood, but should be expressly set forth, and that this demand, realized in some propositions, should be applied to all ? . . . . The habit of looking explicitly at the quantity of the predicate—considering in all cases exactly what we mean—is of the greatest utility in simplifying our logical statement, in restricting it, guarding it against ambiguity and the possibility of invalid conclusions.'[2]

§ 668. Veitch does not claim that a proposition should contain all that the speaker happens to know about the subject, but only that what is logically implied in the proposition itself should appear on the face of it.   'We must state in language what is efficient in thought.'   We must 'enounce as we think'.

To which the answer is, that the demand is an impossible one.   The nature of the proposition, i. e. the form of all thought, forbids it.

§ 669. In the above passage a simpler issue would be presented if the paradoxical claim to be able to say 'All X is all Y' were kept distinct from the claim to be allowed to say 'All X is some Y'.   For it may be said that the latter, but it cannot be said that the former, statement is implicit in the ordinary A judgement. Let us then defer the more thorny question, and examine first the easier one.

[1] *Discussions*, p. 679.
[2] *Institutes of Logic*, pp. 295, 296, 298.

§ 670. Now it is true that, as shown above (§ 638), the quantification of the subject of a proposition determines the extent of the predicate term which the predication covers. If seven X's are Y, those seven X's are identical with seven Y's, *each with each* ; and of Y's seven, therefore, are X. If now we use a quantification of which the actual empirical extent is not given, such as *all* or *some*, and say that all X's, or some X's, are Y, we imply that a portion of the Y class is involved in the statement equal to the real extension of the subject, and that, in either case, some Y's at least are X.

An affirmative proposition about X and Y thus imports that a certain number of X's are Y (and the same number, were it ascertained, of Y's are X), and also that to that extent the two spheres of X and Y coincide.

§ 671. But here are two assertions, one about X's (and by implication Y's) severally, the other about extended *wholes*. The former necessarily involves the latter, but the latter does not necessarily involve the former. If all men are mortal, this implies that the human class and the mortal class of objects coincide to the extent of the whole of humanity. But if some (a certain number of) ounces are some (a certain number of) pounds, it does not follow that any ounce is a pound.

§ 672. Now the propositions 'All X is some Y' and 'Some X is some Y' can only be rather awkward English for 'The whole of X, or a portion of X, corresponds to a portion of Y'.[1] They cannot mean grammatically that all X's, or some X's, severally and individually are some Y's, nor do they, as we have just seen, necessarily involve the statement that all X's, or some X's, are Y's at all.[2] When Veitch says '*It* (the subject) must have *some* place in the class' to which it is referred, what does he mean by 'it'—the subject as an extensive whole, or each several

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[1] In the trial of Harrison the regicide Chief Justice Yelverton used the phrase—'You, Mr. Harrison, are not anybody. You know the law.' 'Anybody' here is ὁ τυχών, any ordinary person.

[2] Veitch insists on the right to take 'all' in either a distributive or collective sense. Yes, but it cannot have both senses together. He meets the criticism that 'Every several A is every several B', if it has any meaning at all, is two propositions in one by saying that if 'compound propositions' are to be forbidden, the only admissible form is the Singular Judgement (p. 318). But universal and plural judgements are not composite in any sense which in the least resembles the two-in-one-ness of 'Every A is every B'.

member of the subject? The individual units have only *one* place each in the predicate class. *Each* is a member of it; *together* they are a portion of it.

§ 673. It is possible that some formula might be devised which would combine both statements about the relations of X and Y. The proposed formulas certainly do not do so. Nor can we even admit (what is implied in ' Enounce as you think ') that the extent of the predicate, though logically implied, is actually in the thought. 'The twelve Apostles were inspired' implies the existence of twelve (at least) inspired beings or objects. But what is before the mind is merely an intensive attribute, the fact that the Apostles were inspired.

§ 674. So far we have been dealing merely with violence done to grammar. The matter becomes much worse when it is sought to legitimate propositions of the form 'All X is all Y' or 'Some X is all Y'. *These* are not contained implicitly in any proposition about X's taken severally. ' I may know and mean,' says Veitch, 'that the subject occupies the whole of the class to which it is referred. Why then not express this?' Because it can only be known *vi materiae*.[1] He says, 'I may *mean* it.' But no proposition about the several X's can *imply* it. ' Enounce as you think' has already become 'Enounce as you know'. It is a fact that equilateral and equiangular triangles are identical. But this does not appear in 'All equilateral triangles are equiangular'. Further knowledge must be supplied.[2] We might parenthetically insert, 'and they only'; but this is to introduce a

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[1] ' It is hardly necessary,' says Hamilton, ' to say anything in confutation of the doctrine that in Reciprocating propositions the predicate is taken in its full extent *vi materiae*. . . . As form is merely the necessity of thought, it is as easy to think two notions as toto-totally coinciding (say *triangle* and *trilateral*) as two notions toto-partially and parti-totally coinciding (say *triangle* and *figure*)' (*Lectures on Logic*, ii. 297). True. But the point is that the reciprocation is not formally implicit in the proposition. Formally, the propositions, ' All triangles are trilateral,' and ' All triangles are figured ', are exactly alike. That in the former there is equivalence of extent between subject and predicate, and not in the other, is known materially only.

[2] Similarly, if spades are trumps the player knows that every trump is a spade. But only because trumps are confined to one suit—a fact which has to be supplied. Conceivably, there might be no such thing in the universe as plurality of causes, and every attribute might be a *proprium*. Yet this circumstance would still have to be stated. The logical import of a universal proposition would not be affected by it.

second proposition. If 'All is all' has any grammatical meaning, it will be only in such a sentence as, 'All the departments of France are all the old provinces'; which does *not* imply that each is each. A statement about aggregates allows us to assert nothing about the individuals which make up the aggregate on either side.

§ 675. This confusion, encouraged by the unchecked use of symbols, and also by the fondness of logicians for illustrations taken from natural kinds, as man, animal, salt, virtue, &c., could hardly, it might seem, have arisen if the double meaning of 'all' had been borne in mind.[1] It ought to be at once dispelled by saying 'All X's', or 'Every X', instead of 'All X', and 'Some X's' instead of 'Some X', when we are asserting anything about the several X's. We can say loosely, 'Every X is a *kind*, or *sort*, of Y'; or, more loosely still, 'is a *species* of Y.' But we really mean, *belongs to* a kind, sort, or species of Y. 'A lion is a kind of cat' does not mean that each lion is a separate kind.

§ 676. Hamilton, however, affirms that 'All man is all risible' has both a collective and distributive meaning, and rashly declares that 'it will not be asserted that any quantification is, *per se*, necessarily collective or necessarily distributive'.[2] 'Taken distributively it means, *Every several man is every several risible.*' Now this seems to mean that the attribute of being every several risible is predicable of every several man— an absurd and senseless proposition. But what is meant, doubtless, is that every man pairs off, and is identical, with a risible, and that there are no risibles left over. Similarly, 'Every X is some Y,' 'Every miller wears a white hat,' must mean, not that every miller is some several wearers of a white hat, but that every miller is identical with a white-hat-wearer, and that (probably) there are not enough millers to go round.

§ 677. In these strained and unnatural formulas—yet far worse are to come—objects are predicated of objects, things of

[1] Latin has various words for 'all'. Thus, Languet, a social compact writer, says, 'Magistratus a populo delecti, ut singuli Rege inferiores sunt, ita universi superiores.'

[2] *Lectures on Logic*, ii. 296, 297. Yet he himself (ibid. p. 313) quotes Ridiger, *De Sensu Veri et Falsi* (1709), who says :—'Origo huius erroris neglectus notissimae aequivocationis signorum *omnis* et *quidam* esse videtur, qua haec signa vel collective sumi possunt vel distributive.'

things. We have evidently travelled a long distance from Hamilton's doctrine of predication as notional inclusion to this ultra-Nominalist position. One of the principal results of quantifying the predicate is to be 'the revocation of the two Terms of a proposition to their true *relation* ; a proposition being always an *equation* of its subject and predicate '.[1] Veitch avows that this 'later doctrine' requires some reconciling with the other, and tries to find it in the idea of *part* and *whole*, a predicate notion being recognized intensively as a constituent part of the subject notion, while in extension a 'higher or superior concept' (the predicate) 'stands over' a 'lower or inferior' concept (the subject) in a relation of superordination.[2] But subordination and superordination are not equation.[3] And equation is not identification—' Every X is every Y'.

§ 678. No room appears to be found in these statements for the usual and natural view of judgement, that the subject is in extension and the predicate is thought intensively—e. g. 'The prince is angry'; 'All our clocks are wrong'; 'Infants grow quickly.'

§ 679. Though in every judgement we think the attributive 'is', while only in a few do we think the quantitative 'equals', yet undoubtedly there are ways of expressing the circumstance that the spheres of a subject and predicate are co-extensive, that there is a mutual inherence, a reciprocation of attributes. But ' Every X is every Y' (or, 'All X is all Y'), if it were English, which it is not, would be two judgements, not one. The expression, Mill points out, involves a twofold *quaesitum*, and cannot be contradicted by any single proposition. To reply that 'All X is all Y' is contradicted by 'All X is not all Y' is no reply at all. For the latter expression may deny the co-extensiveness of X and Y, but does not contradict the possibility of every

[1] Op. cit. p. 250. Enough has been said elsewhere against the Hobbesian view that 'the predicate is the name of the same thing as the subject'. But though, as Bradley objects (*Logic*, p. 344), A cannot equal B, A can equal, or be identical with, $B\,C$. 'Caesar is sick' does not identify or equate 'Caesar' and 'sick'; but it does affirm identity between Caesar and a certain sick person or object.

[2] Ibid. i. 190.

[3] If ' a proposition is always an equation of its subject and predicate', quantity is part of the subject and part of the predicate. For what are equated are not the terms, but the terms as quantified.

X being Y, or, if not, of every Y being X. It only refers to X and Y as wholes.[1]

§ 680. To say, ' Every X is every Y,' is as though we said, ' Each of ten soldiers is ten wounded men.' No doubt, the several X's can be asserted to belong to a specified number of Y's—e. g. ' Every Chinaman belongs to the fourth part of mankind'; 'Six of the diamonds are among the twenty stolen ones'; ' None of the stolen diamonds is any one of the fifteen in your hand'; 'Some maniacs do not belong to a particular portion of the lunatic class.' But this is in no sense to equate, or identify, all X's, or some X's, with a quantitatively specified or indicated group or aggregate. ' Every X is one of ten Y's.' But Hamilton leaves out ' one of '.[2]

§ 681. He condemns 'the one-sided view that the proposition is not equally composed of the two terms, but is more dependent on the subject than on the predicate.[3] But such indifference of subject and predicate involves a Leucippian atomism. It makes knowledge to be an identifying of isolated units of fact, each of which is another. It is at variance with the structure of human thought. Yet, if universals are not to be wholly abolished, 'All X's ' means 'If any object whatsoever is X'. ' All X's are all Y's ', then, stands for 'siquid est X est siquid est Y'. Now, if *meum* and *tuum* between friends are the same, such an expression as 'Whatever is mine is whatever is yours' might be intelligible. Yet it could only be a compendium irregularly phrased of the two propositions 'Whatever is mine is yours' and 'Whatever is yours is mine '.

[1] Hamilton is in a position (*Discussions*, pp. 688, 694) to cite ' a very able logician, Mr. Mansel ', as writing (in the *North British Review*, vol. xv, p. 116) that, psychologically as well as logically, ' All A is all B' is a single judgement. ' The true contradictory we take to be " All A is not all B", which, like the original proposition, may be treated collectively or distributively.' But Veitch (*Institutes*, p. 316) expounds Hamilton's meaning thus :—' We can say readily, *the whole class man is not identical with the whole class mortal.* That is all we need to say in order to deny. We deny the equivalence of the terms as wholes.'

[2] De Morgan, on ' the numerically definite proposition ', urges that if the number of X's is known, and also the number of Y's, we may have an affirmative judgement, ' 45 X's (or more) are each of them one of 70 Y's '; and a negative judgement, ' 45 X's (or more) are no one of them to be found among 70 Y's.'

[3] Ibid. ii. 274.

§ 682. The following are some reciprocating propositions :—[1]

The Nile is Egypt and Egypt is the Nile.

πιστὴ τοίνυν ἡ γνῶσις, γνωστὴ δὲ ἡ πίστις St. (Clem. Alex.).

Snowdrops and February Fairmaids are the same flowers.

What is real is rational and what is rational is real (Hegel).

Nought is everything and everything is nought.

Calculer c'est raisonner, et raisonner c'est calculer (Condillac).

If ye forgive men their trespasses, my heavenly Father will forgive you your trespasses. If ye forgive not men their trespasses, neither will my heavenly Father forgive you your trespasses.

The spheres of the true and the beautiful are the same. A phrase like 'Nothing true is new, and nothing new is true' is an E proposition, superfluously converted.

§ 683. It may be granted that, if judgements were equations, all Conversion would be Simple Conversion. On the other hand the New Analytic requires the most wearisome feats of mental gymnastic in other ways. Even the number of propositional forms leaps at once from four to sixteen, as will be seen by combining the possible subjects with the possible predicates :—

$$\left.\begin{array}{l}\text{All } X \\ \text{Some } X \\ \text{No } X \\ \text{Not all } X\end{array}\right\} \quad \text{is} \quad \left\{\begin{array}{l}\text{all } Y \\ \text{some } Y \\ \text{no } Y \\ \text{not all } Y\end{array}\right.$$

These, however, are reduced to eight by cancelling one of each pair of so-called equivalents ; thus—

(1) All X is all Y (U) equivalent to   No X is not all Y

(2) All X is some Y (A) „   No X is no Y

(3) All X is no Y (E) „   No X is some (any) Y

(4) All X is not all Y „   No X is all Y

(5) Some X is all Y (Y) „   Not all X is not all Y

(6) Some X is some Y (I) „   Not all X is no Y

(7) Some X is no Y (O) „   Not all X is some Y

(8) Some X is not all Y „   Not all X is all Y.

(U) and (Y) are symbols suggested by Archbishop Thomson.

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[1] Perhaps this very phrase will be claimed as quantifying its predicate. But 'the following' is a concrete aggregate. Substitute 'each of the following' and 'some' could no longer stand in the predicate.

§ 684. It will be seen that we can no longer shrink from grappling with the case of Negative Quantifications, which is many times more repelling than that of 'All X is all Y' and 'Some X is all Y'. In negative judgements the relation between subject and predicate, according to Hamilton, is one of 'non-equation'.[1] 'Non-equation', which he also calls Non-identity or Co-exclusion, should mean that the quantifications are not equal. And yet it appears from the foregoing table that each kind of negative judgement answers to an affirmative one; and the import of every affirmative judgement Hamilton asserts to be an equation. Moreover he describes all conversion, negative as well as affirmative, as an 'equi-version'— ἀντιστροφή ἐστιν ἰσοστροφή τις.

§ 685. A denial of equation must relate to wholes, and cannot be distributive. It is not the same thing as exclusion. If I deny an equality between seven sous and three francs, I am referring to the totals. But in 'No men are sinless' or 'Some puppies escape drowning', the subject is distributively, as well as in the aggregate, excluded from the sphere of the predicate. How now are we to interpret the equivalent of 'All X is all Y', viz. '*No X is not all Y*'? 'It is not true of any X that it is not all Y' cannot be the meaning intended, though it is the meaning (so far as they have any meaning) of the words.

§ 686. Hamilton surely ought to have said that in negative judgements there is an implicit equation of *negated terms*, or of a positive and a negative term. Thus, the following identifications of negative sphere are involved in the propositional forms given above :—

(1)   All non-X = all non-Y
(2)   Some non-X = all non-Y
(3)   Some non-X = all Y
(4)   Some non-X = some Y
(5)   All non-X = some non-Y
(6)   Some non-X = some Y
(7)   Some X = some non-Y
(8)   Some non-X = some Y.

On the other hand, 'No X is no Y' has no meaning as an equation at all. Distributively, it might be supposed to mean that not any X is excluded from the entire sphere of Y, is not

[1] *Lectures on Logic*, ii. 257.

a Y of some sort or other. This is the ordinary A judgement, 'Every X is Y.' The equation is 'All $X =$ some Y', or 'Some non-$X =$ all non-Y'. 'No X' cannot mean 'all non-X'. The following from the *De Civitate Dei* is in the form, ' No non-X is Y'—'ubi non est iustitia, ibi non est respublica'; or this—'No bishop no king'.[1]

§ 687. It was not till 1840 that Hamilton hesitatingly persuaded himself that Quantification of the predicate might be extended to negative judgements.

§ 688. It is often contended that, say what logicians will against quantification of predicates, they are frequently quantified in common speech and syntax. E. g.—

Eight stars are all the planets.

The three boys here are all that robbed the orchard.

These were certainly some of the rioters.

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[1] If 'All X is all Y' (U) is expressed distributively in the form ' Any X is any Y', it surely has for contradictory either ' Any X is not any Y' (E) or ' Not any X is any Y' (E). But the contradictory of E is I, not U. Or can any other single propositional form be suggested to express ' It is not the case that any X is any Y' ?

But it is easier to get a meaning of some sort out of a negative judgement taken distributively than it will be if we regard it as an equation. What can be the possible sense of saying that ' some X' and 'no Y' are equal ? 'No Y' must be supposed unextended. Has 'some X', then, no extension ?

To give an intelligible sense to 'No X is some Y', we must take 'some' to mean 'a certain portion of'. 'No hypocrite is a *conscious* deceiver.' 'Democracy is not a *stable kind of* polity.' 'Some X is not some Y' will be illustrated by the proposition, '*Laboured* verse is not *true* poetry.' Hamilton says :—' In Negative Propositions the logicians say the predicate is always distributed—always taken in its full extension. Now this is altogether untenable. For we always can, and frequently do, think the predicate of negative propositions as only partially excluded from the sphere of the subject. . . . It cannot be pretended that negation has an exclusive or even greater affinity to universal than to particular quantification ' (ibid. ii. 273). For the exclusion of the parti-total and parti-partial negative proposition ' no reason beyond the caprice of logicians and the elisions of common language, can be assigned ' (ibid. p. 294). But ' No men are [a certain kind of] animals ' has a distributed predicate directly we replace the words in brackets by the determination which we have in mind, viz. 'irrational'. And every predicate, being a determination of some further unexpressed notion, may be represented by a blank space. ' Ink is not drinkable' means ' is not a certain kind of liquid '—viz. a drinkable liquid. Observe the difference between the Hamiltonian ' not some ' and the ordinary English ' not any '.

Viola disguised as a page tells Duke Orsino: 'I am all the daughters of my father's house, and all the brothers too.'

Sometimes a numerical equality is asserted by a *tot quot*, or *toties quoties*, as in the Salisbury rhyme beginning—

> As many days as in one year there be,
> So many windows in the church we see.
> As many marble pillars here appear,
> As there are hours throughout the fleeting year, &c.

It is also pleaded that the predicate is quantified in definitions, and by the definite article, especially in Greek, by the superlative degree and in Exclusive and Exceptive propositions, called Exponibles. Thus, 'Brevity is the soul of wit'; 'Order is heaven's first law'; ὕδωρ ἄριστον; 'Only the good are happy'; 'pessimum inimicorum genus laudantes.'

§ 689. But when these cases are examined it is seen that some are equations of totals, some identification of singulars. When we say, 'These are the four possible moves,' we do not mean that this, this, this, and this are severally the four possible moves. The definite article, with or without a superlative— 'London is the key to India'; 'Le style c'est l'homme';[1] Wit is 'de tous les dons de la nature celui qui est le plus dangereux et le moins utile' (Selwyn)—affixes a mark of singularity to a class or object. Infinitives in the same way. Sallust says, 'impune quaelibet facere, id est regem esse.'

§ 690. Hamilton, however, especially relies on 'the equipollent forms of Limitation, or Inclusion and Exception', such as, 'God alone is righteous'; 'Man doth not live by bread alone'; 'Except One, all have sinned'; 'Seul le silence est grand'; 'nobilitas sola est atque unica virtus'; 'I drink water only'; 'My honour is my sole possession'; 'imperii finis unicus populi utilitas' (Languet); 'horas non numero nisi serenas' (a sun-dial). I have dealt with 'only', 'the only,' 'only the' and 'alone' above (§ 619). The last example ('No unsunny hours do I number') is simply A—'All the hours I number are sunny ones'. 'Ce n'est que le premier pas qui coûte'='Tout ce qui coûte est le premier pas'— an identification.

§ 691. While 'not only' marks the predicate of an O judgement, 'only' marks an A predicate. Such a predicate is undis-

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[1] But what Buffon really said in the *Discours* was 'Le style est de l'homme même'—other things being 'hors de l'homme'.

tributed.   From 'Only healthy men are wanted as emigrants', then, it does not follow that all healthy men are wanted.

§ 692. In Definitions the subject and predicate are identical both in extension and intension.   But this does not appear formally on the face of the definition (see above, § 385), except when the predicate is delimited by 'the'—e. g. 'Critics are the painters who have failed'; 'Poetry is the counting of syllables'— or by a possessive pronoun ; e. g. 'Thy people shall be my people, and thy gods my gods '.   In ' Quem nosse vivere ' we have a convertible proposition ; but not in ' laborare est orare '. Keats says, ' Beauty is truth,' but has to add, ' Truth beauty.' The *Times* is a threepenny daily paper.   There happens to be no other.   But for this to appear on the face of the proposition we should have to say, 'The *Times* is the threepenny daily paper.'   Some definitions are couched thus :—' A circle is any figure,' &c.   But this means that ' a circle ' is the name given to any figure which, &c.   'Any figure' may be regarded as the true subject.   We could not say, 'All circles are any figure,' &c., nor yet 'Any circle is any figure', &c.—which must mean that there is an identification between any circle we please and any figure which, &c., taken at random (quodvis X est quodvis Y). One might be the size of a sixpence, the other have the sun's diameter.

§ 693. Once more the point is pressed that the predicates of E and O judgements are undoubtedly quantified to their full extent, while I and E judgements are convertible simply.   Even if it be so, it remains true that a distributive quantification is only possible in the subject. E and O declare that the subject is to be found *nowhere* in the predicate class ; A and I that it is to be found *somewhere* in that class.   ' Some ' is a vague and elastic term.   If we insert it in the predicate, its significance will vary not only with every subject but with every predicate.   Thus, ' Some roses are (some) red ' may mean, are some red objects, are some red flowers, or are some red roses.   In each case ' some ' stands for a different quantification ; in the last it is equivalent to ' all '.   In fact, the predicate of an affirmative proposition is necessarily indefinite in extent.   In intension, the four forms of judgement may be expressed thus in a single conjunct sentence—' All, or some, X's have, or lack, the characteristic of Y-ness '.

§ 694. To conclude this tedious but necessary discussion. The absence of quantification from the 'traditional' forms of judgement is not an 'absurd' imitation of 'the aberrations of common language', nor a mere 'conformity to the precarious ellipses of common speech',[1] but is required by the nature of predication. Hamilton says that the integrate or mathematical whole, as distinct from the universal logical whole, has been contemned by philosophers, since 'all that is out of classification, all that has no reference to genus and species, is out of Logic, indeed out of Philosophy'. Undoubtedly, philosophy deals with the universal and the conceptual, for ever bringing the more particular under the more general. It classifies things according to their qualities, and judges what a thing *is* rather than the amount of space which its extension occupies in relation to a wider class. It is left to Algebra to draw out the equivalence of sums total.

§ 695. If, therefore, the quantifiers had merely pointed out that every judgement, besides its direct significance, involves implicitly a quantitative identity between aggregates, and had constructed a subsidiary syllogistic scheme based on the quantified predicate, it might have had a limited utility as a byway of thought, or as a school exercise. But quantification of predicates can only be made the basis of a universal system of reasoning by falsifying the import of the proposition and by the employment of unnatural propositional forms. Who has more pungently insisted on the danger of corrupting Logic by mathematics than Sir William Hamilton?

§ 696. The general formula of Judgement, according to De Morgan, would be, 'Every one of a specified X's is one or other of b specified Y's.' When such a proposition is combined syllogistically with another, on the principle of supra-totality, or overlapping middle term, the possible varieties of syllogism will be infinite. Jevons considers $A=B$ to be 'the simple form of all reasoning', the distinction between subject and predicate becoming merely grammatical. If this be so, reasoning becomes, what Condillac and Hobbes asserted it to be, a mere adding and subtracting, and the science of Logic could be written on a half-sheet of note-paper.

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[1] *Lectures on Logic*, ii. 290, 291.

§ 697. It will be necessary to glance again at Hamilton's doctrine, which, bearing the authority of a great name, has so vexed the logical Israel, when we come to the Syllogism. For it is in the simplifying of syllogistic theory that he places its chief results. Veitch, contending that Logic must be ' an unexclusive reflex of thought, and not merely an arbitrary selection of the forms of thinking ', reproaches the logicians for their ' contracted views '.[1] Certainly they are content with nineteen legitimate moods out of sixty-four possible ones. Hamilton, however, calculates that a quantified predicate yields 3,072 possible moods, of which 480 are legitimate.[2]

§ 698. The levelling atomism which turns all conceptual thought into an identification of equals,[3] and makes all conversion to be simple conversion, appears in Dr. Bosanquet's attack on Plurality of Causes. He writes :—

' It is a corollary from the idea of Ground that the hypothetical judgement when ideally complete must be a reciprocal judgement. " If A is B it is C " must justify the inference, " If A is C it is B." . . . It is obvious that the idea of coherence in a system is reciprocal. A cannot cohere with B unless B coheres with A. If in actual fact this is found not to hold good, and AB is found to involve AC, while AC does not involve AB, it is plain that what was relevant to AC was not really AB, but some element $\alpha\beta$ within it.'[4]

§ 699. He rejects the ' tempting suggestion ' that ' the irrelevant element is just the element which made AB as distinct from AC, so that by abstracting from it AB is reduced to AC, and the judgement is made a tautology, i.e. destroyed '. A sailor defends his country, shall we say ? So also does a soldier. The irrelevant element in ' sailor ' is that his defence of his country is on the sea. But it is just this which differentiates him as a sailor. Bosanquet, however, maintains that 'a

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[1] *Institutes*, p. 291.   [2] *Lectures on Logic*, ii. 356.

[3] In the extreme Nominalism of Antisthenes all distinction between subject and predicate disappeared, the name (sense-impression) simply repeating itself, and even identification becoming a mere tautology. Assertion and instruction in such a system there can be none. We can but point aimlessly with the finger and make meaningless sounds. For directly the sounds have a general meaning, the universal reappears. Knowledge is thus impossible.

[4] *Logic*, i. 261.

systematic relation is always within an individual whole '. Sub-
ject and predicate are discarded. 'The priority or antecedence
of the elements [of the judgement] belongs to the imperfection
of knowledge, and not to the relation itself.'

§ 700. He goes on :—

'Apart from time and irrelevant elements, I cannot see how
the relation of conditioning differs from that of being con-
ditioned. Every B that is conditioned by A is the condition of
A being such as to condition B, i.e. of A being what A is. . . .
In other words, if there is nothing in A beyond what is
necessary to B, then B involves A just as much as A involves
B. But if A contains irrelevant elements, then of course the
relation becomes one-sided.'

§ 701. Elsewhere this writer urges that, to purge the judge-
ment of irrelevancy, it must pass through scientific induction.[1]
To roast a logical pig, we may suppose, it is not necessary to
burn down one's house, though the Chinese mind was slow
to perceive how much was irrelevant in such cookery.

§ 702. Equality between subject and predicate, however, may
be restored by noting that the irrelevant part of the cause is
reproduced implicitly in the effect. So that, whereas drowning
and poisoning both produce death, the one produces death by
drowning and the other death by poisoning. The complete
judgement will be, 'To be drowned (or poisoned) to death is to
be put to death by drowning (or poisoning).'

§ 703. Every effect, in fine, is but the total antecedent. And
since neither total consequent nor total antecedent can be de-
limited, and the idea of time *post* or *ante* must be left out or
regarded as common to both, we reach the result that the one
and only assertion possible to be made is this, that the universe
of things is itself,—a solitary, undifferentiated point. All A is
all A.

§ 704. It would seem then that all judgement is an imperfect
endeavour towards this propositional simplicity, and that all
judgement will be at last swallowed up in pure contemplation—
a fixed stare. As men advance in knowledge they will have
less to say, and ideas and speech mark the world's nonage !

§ 705. Logic at any rate belongs to the region of conceptual
thinking. The effort to bring experience under this or that

[1] *Logic*, ii. 88, n. 1.

notion, to reduce the multiplicity of presented matter to the unity of conceived form, implies that the same consequent may have different grounds. Whence the danger of careless analogy, and of undistributed middle terms.

§ 706. A rumbling noise may be due to distant thunder or a passing train. Both grief and an onion will bring tears to the eyes. Life, says Seneca, has one entrance but many exits. The evidence against a prisoner may be false, yet he be guilty. A judge's reasons may be wrong, yet his decisions right. There are two answers to a quadratic. τὸ γῆμαι καὶ τὸ μὴ γῆμαι κακόν—both bring woe. Bear-baiting would be condemned now because it gives the bear pain. According to Macaulay the Puritans frowned on it because it gave the spectators pleasure. It is related of two very prosperous persons that, being interrogated as to what they considered to be the cause of their success, one ascribed it to his having answered every letter by return of post, the other to his having never answered any letters at all. There is more than one way of making money—*quocumque modo rem.*[1] Indeed every common name implies one in many. Every three-sided figure is a triangle, whatever the length of the sides. A book is a book, whatever its contents.

§ 707. Because X is Y, then it does not follow that Y is entirely made up of X. And if Y is Z, but no X is Y, it is yet possible that X will be found to be Z in some other way, that is, through some other middle term. A conclusion is more abstract as a proposition than it is as a conclusion; for it may be reached in various ways.

We thus come at last to the Syllogism, and the law of its construction.

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[1] It is owing to the logical possibility of plural causes—even when as a contingent fact only one cause is adequate to a certain effect—that judgements are always logically liable to be mistaken. For every judgement, as we have seen, is an interpretation (§ 26). I fire; and, the hare rolling over, I say, ' I have shot her.' But some one else may have shot her; or she may have dropped through fright or heart-disease. At any rate abstract certainty is unattainable. This is so not only in those judgements which are directly about causes. If I say, ' The sky is blue,' or ' It is raining ', the impression on my senses may have been brought about in some other way than I suppose.

CHAPTER XXII

SYLLOGISM .

§ 708. ALTHOUGH it has been argued above that Concepts and Judgements do not, as such, possess a rational internal character, since whatever is reasoned can only be reasoned through a middle term, and whatever construction has a middle term is a syllogism, it has been necessary to consider Conception and Judgement at length. For when we are analysing the pure form of anything it is of no consequence what is the nature of the particular matter of which it is composed. But the materials supplied to the Reason to syllogize with help to determine the form of the Syllogism, which is not pure reasoning —an impossible thing for us—but reason governing the connexions of actual human thought. Judgement, as conceptual, possesses a vital structure which enters into the life of Inference.

§ 709. A combination of two concepts or notions gives rise to no ratiocination—e.g. Australian gold and buried gold ; for the implied particular propositions—'Some gold is Australian '; ' Some gold is buried '—can together yield no conclusion. Nor can a proposition be subsumed under a notion; for this would make a particular proposition a rule. But a notion can be subsumed under a universal proposition. E.g. 'All gold is valuable'. Then the idea of a golden egg is the idea of a valuable egg. ' Union (only) is strength.' Then a disunited Christendom is weak, and a weak Christendom is disunited. 'The self-restrained are unimpassioned.' Then the idea of an occasionally passionate man is the idea of one who occasionally loses self-restraint.

§ 710. A notion subsumed under a general proposition is equivalent to the combination of a categorical major with a hypothetical minor premiss.[1] ' Only the united are strong.'

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[1] In Aristotle's Rule of Syllogism, ἐν ἅπαντι (συλλογισμῷ) δεῖ κατηγορικόν τινα τῶν ὅρων εἶναι καὶ τὸ καθόλου ὑπάρχειν (*An. Pr.* i. 24. 41ᵇ 6), κατηγορικόν

Then, if Christendom be disunited it is weak. The conclusion is true hypothetically. Of course both premisses may be hypotheses—'If I lived in London, and London were smokeless, I should live in a smokeless place.' The supposition of *S* being *M* and of *M* always being *P* is the supposition of *S* being *P*. Or the major premiss alone may be hypothetical. ' I live in London. If, then, London were smokeless I should be living in a smokeless place.' This is a combination of fact with idea.

§ 711. Usually in our reasonings both premisses are assertions of fact. But it makes no difference to syllogistic theory whether we deduce a result from *supposed* or from *asserted* propositions. In either case the conclusion, *as a conclusion*, stands or falls with the truth of the premisses. Its truth in fact is conditioned by their truth. Yet the reasoning is unconditional and absolute. 'It undoubtedly follows that, &c.,' so that a conclusion is always stated as inevitable. And it is not a bit more necessitated where the premisses are necessary truths than where they are random guesses. *S* is necessarily *M* and *M* is necessarily *P*. Then it necessarily follows that *S* is necessarily *P*. Aristotle well defines Syllogism as λόγος ἐν ᾧ τεθέντων τινῶν ἕτερόν τι τῶν κειμένων ἐξ ἀνάγκης συμβαίνει τῷ ταῦτα εἶναι.[1] But, with ontological logicians generally, he regards the highest reasoning as *apodeictic*.[2] Next to such demonstrative proof he places those statements which

means *affirmative*. The other premiss must be a universal. This, the major, premiss was called by the schoolmen *propositio* or *sumptio*, and the minor *assumptio* or *subsumptio*. Sumption and Subsumption are the expressions brought into vogue by Hamilton. They are also called *praemissa continens* and *praemissa applicativa*.

[1] *An. Pr.* i. 1. 24ᵇ 18.

[2] His συλλογισμὸς ἐξ ὑποθέσεως aims at demonstrating the truth of the assumption on which some other assertion depends. Sigwart remarks:— ' The Aristotelian doctrine of the Syllogism presupposes established relations amongst concepts. Aristotle himself assumes an objective system of concepts which realizes itself in the material world in such a way that the concept manifests itself everywhere as constituting the essence of things and as the cause of their particular determination. Thus all judgements containing true knowledge are for him the expression of necessary relations, and the function of the syllogism is to reveal the whole force and bearing of each particular concept in our knowledge by combining particular judgements and making them mutually dependent through their conceptual unity. . . .Ordinary logic, on the contrary, is based upon a subjective system of concepts, which is not sought for in the process of knowledge, but is assumed as a preliminary datum.' (*Logic*, i. 349, 350.)

draw out the essential nature of things. From the same extra-logical standpoint Ueberweg observes:—' Perfect knowledge rests on the coincidence of the ground of knowledge with the real cause. Hence that syllogism is most valuable in which the mediating part (the middle term), which is the ground of the knowledge of the truth of the conclusion, also denotes the real cause of its truth.'[1]

§ 712. We can only reply that Logic is not concerned with the valuableness, but only with the validity, of a syllogism, and that it could only aim at 'perfect knowledge' by investigating not the formal relations but the material content of thought. Directly it asks questions about the *data* supplied to it, it ceases to be Logic.

§ 713. A conclusion is not a conclusion apart from its premisses, the whole constituting inference, which is an indivisible mental act. 'In consciousness,' remarks Hamilton, 'the three notions and their reciprocal relations constitute only one identical and simultaneous cognition.'[2] Inference, however, is not cognitive but ratiocinative. It may be cast in the form of a necessary proposition—' The case of S being M and of M invariably being P is necessarily the case of S being P'—; but the necessity is given by the reason not by the judgement. A complex comparison between three terms compels a rational unification, which is not itself comparison, that is to say, is not a judicial act. As Judgement is the intellective reference, so Inference is the rational reference, of an ideal content to reality. And it is therefore always stated as unquestionable.

§ 714. What is the formula, then, of Syllogism?

Hamilton adopts the formula, *A part of the part is a part of the whole,* as applicable whichever way we read the syllogism—in Extension or in Intension. It certainly will do duty both for class-inclusion (S is part of class M, and class M is part of class P) and for notional inclusion (P-ness is part of the notion M-ness, and M-ness is part of the notion S-ness). But we have already had to insist that notional inclusion is peculiar to analytic judgements. 'Has his day' is not part of the notion 'dog', nor 'is a busy time for grocers' part of the connotation

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[1] *Logic*, p. 337. 'The ground of Being is the only genuine and complete ground of knowledge' (Bosanquet, *Logic*, ii. 264).

[2] *Lectures on Logic*, i. 276.

of 'Christmas', nor 'destructive of civilization' part of the meaning of 'equality'.

§ 715. Mill points this out.[1]   A property of the circle is that its circumference stands to its diameter in the approximate ratio of 3·14159 to 1.   Now even those who regard a notion as a fixed, normal content, universally accepted, will hardly affirm that this ratio is in the mind of the ordinary person who talks about a circle and whose eye can at once detect when the moon is not quite full.   But Mill's criticism of Hamilton's formula overshoots the mark.   Hamilton's instance of syllogistic inclusion or comprehension is this—*Man* comprehends *responsible agent*, and *responsible agent* comprehends *free agent*.   Therefore *Man* comprehends *free agent*.   But, Mill objects, if the last notion is part of the middle notion, and that is part of the first notion, how is not *free agent* at once recognized as part of the notion *Man*, since the notions, by supposition, are in the mind? What need of a middle notion at all?   If the meaning of *Man* has been partly forgotten, or is indistinct, it is to that extent not possessed by the mind, and, not being there, cannot be proved to be there by ratiocination.

§ 716. But the whole meaning of analytic or explicatory judgement is that it brings to light and to conscious recognition what was before only implicit in a notion.   And Mill's criticism extends equally to all inclusive aspects of judgement, whether inclusion of a subject in a class or inclusion of a predicate among attributes.   If we know that S is included in class M and class M is included in class P, we infer that class S is included in class P.   Again, if P-ness is included among the attributes of objects that are M, and M-ness is included among the attributes of objects that are S, we infer that P-ness is included among the attributes of objects that are S.   But, Mill would say, why pass through M at all?   In other words, if I know that a penny is circular, and know also that the length of the perimeter of a circle is to that of its diameter as 3·14159 is to 1, then, since these items of knowledge are, by supposition, in my mind, I know that those are the measurements of a penny without my mind passing through the intermediate idea of circular.

§ 717. This is, of course, the old fallacious charge against

[1] *On Hamilton*, c. xix.

the Syllogism that it involves a *petitio principii*, to which charge we shall have to return later. In asserting M to be P (major premiss) we have already, it is said, asserted S, which is known to be part of M (minor premiss), to be P (conclusion). The wider knowledge includes the narrower. Must, then, major and minor premisses be always apprehended simultaneously? I see in the papers that the *Belle Amélie* has gone down with all hands. I learn six months after that my friend was on board. According to Mill I knew he was drowned directly I heard of the crew's fate. There are major premisses as old as Time still waiting for their minors. There are facts of experience for which no law has yet been discovered; and what is progress in reflective knowledge (ἐπίγνωσις) but the fuller realization of what is implied in some old conception?

The school of Mill writes about our ideas as though they lay dissected under glass cases, and about our acquaintance with facts as though we knew everything not discursively but simultaneously and equally. Inference becomes simple inspection, as in a visualized notation, without the eye having to travel from space to space.
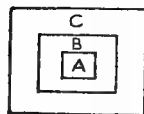
§ 718. The formula for Syllogism preferred by Mill—*Nota notae est nota rei ipsius*—is open to exactly the same criticism that he directs against *A part of the part is a part of the whole*. It is exposed to the further objection that it cannot stand for Extension as well as Intension. A graver fault in this formula is that it is dangerously ambiguous. For the mark of anything must mean an indication by which we can know the presence or existence of that thing. But the predicate of a proposition, even of a universal one, is no sure indication of the presence of the subject. All pennies are circular coins; but circularity in a coin is no conclusive indication or token of it being a penny. Being worth, nominally, $\frac{1}{240}$ of a £ would be; but that is because we get there a convertible proposition, since no other coin is of that exact value. The formula, *nota notae est nota rei ipsius*, then, only serves for a limited number of propositions. It might perhaps be said, 'Happiness is a mark of contentment, and contentment is a mark of humility; therefore happiness is a mark of humility'—though even this will not bear much scrutiny.

§ 719. It is difficult to translate the formula into the terms of Mill's explanation. He says, 'It means that two things which constantly co-exist with the same third thing constantly co-exist with one another.'[1] What is meant by A constantly co-existing with B? That where the one is found the other is also found? But this is a double proposition (see above, § 674). It either means, then, that where A is found B is also found, or that where B is found A is also found. Falstaff says, 'You cannot separate age and covetousness'—not that the covetous are always old, but the old are always covetous. But how is the syllogism to proceed? No further statement about the old will allow us to infer anything universally about the covetous, nor will any further statement having 'covetous' as predicate enable us to infer anything at all about the old. Where then is the constant co-existence between two things which constantly co-exist with a third?

§ 720. Again, Mill's canon makes no provision for syllogisms with a particular minor premiss. Nor yet for syllogisms with a negative premiss. Hutcheson's formula, adopted by many modern writers, 'Things which agree with the same third agree among themselves,' is, as a rule for affirmative inferences, as faulty as Mill's. But negative syllogisms in the Second Figure find a rough formula in the following :—'Things whereof the one agrees, the other does not agree, with one and the same third, these things do not agree among themselves.' Yet though the one is not the other, they may agree in certain respects. A coster-monger sells apples, and a newsvendor does not; but both (as the names imply) sell something. Probably by 'agree' is meant coincidence in extension. This assumes an equational Logic.

§ 721. Hamilton's notional inclusion, or exclusion, it should be added, equally leaves no room for particular inferences. For though a notion can be partly included in another notion, as 'four-footed' and 'two-footed' share the characteristic of having feet, yet this does not allow us to say that some bipeds are quadrupeds. For the rest, his formula seems as weak as that of his eminent critic. 'Reasoning,' he says, 'is an act of mediate comparison or Judgement; for to reason is to recognize that two notions stand to each other in the relation of a whole and its parts, through a recognition that those notions

[1] *On Hamilton*, p. 442.

stand severally in the same relation to a third.'[1]   It is only in one mood of Figure III (*Darapti*) that this happens; and then the conclusion is a particular one, and is not concerned with any relation of whole and parts.

Conditions of Valid Inference.

§ 722. Inference is, broadly, the bringing of a case under a rule, or else the denial that a rule applies to a certain case.

No conclusion, accordingly, can be drawn from a pair of premisses which are mutually inconsistent ('No A is B'; 'Some B's are A') or mutually unrelated ('A is B'; 'C is D'). They will be unrelated (i) if neither premiss be universal; (ii) if both be negative; (iii) if there be no middle term; (iv) if the middle term be not taken once at least in its full extension; (v) if there be more than three terms.[2]

§ 723. Caution (i), against two particular premisses, insists that 'once at least in every inference you must show your hand and develop your universal in terms of its positive content'.[3]   There must be a rule of some kind.   Seeming exceptions are when a mark of occasionalness attaches to the predicate—e. g. 'The wisest sometimes make mistakes'.   Compare 'A friend loveth at all times', and contrast 'Windsor Castle is frequently the residence of the Sovereign' with 'Castles are frequently ruinous'.   The two propositions 'John is sometimes merry' and 'John is often in great pain' will yield the conclusion (in *Darapti*) that there is one instance at least of a person who often suffers great pain being sometimes merry.

This syllogism, however, has two singular premisses, and

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[1] *Lectures on Logic*, i. 274.

[2] The principal syllogistic rules are contained in the following lines :—
> Distribuas medium; nec quartus terminus adsit ;
> Utraque nec praemissa negans, nec particularis.
> Sectetur partem conclusio deteriorem,
> Et non distribuat, nisi quum praemissa, negetve.

What is meant by the conclusion 'following the worse part' is that if either premiss be negative it must be negative, and if either be particular, particular.   The Port Royal Logic has the following :—
> Aut semel aut iterum medius generaliter esto.
> Utraque si praemissa neget, nihil inde sequetur.
> Ambae affirmantes nequeunt generare negantem,
> Nil sequitur geminis ex particularibus unquam.

[3] Bosanquet, *Logic*, ii. 111.

this is another seeming exception to the caution that one must be universal. But a proper name or designation of a definite object or aggregate ranks for syllogistic purposes as a universal, the minor term being identified with it. E. g. 'This rose takes the prize. It is the one you gave me'. There is a well-known story of Keate at Eton getting two lists of names mixed, and flogging his Confirmation class. Sometimes the minor term is not identified with a singular middle, but really subsumed. E. g. 'Vandyck always painted nobly. This is one of Vandyck's works. Then it is painted nobly.' 'Edward is always late. Then he will be late to-day.' 'Ecclesia non sitit sanguinem. The bishop, then, will intercede for him.'

§ 724. The rule against two negatives is a caution against disconnexion. Yet if I want to find that S is P, and know that no M is P, it will encourage me to remember that no S is M. For if any S were M, to that extent S could not possibly be P. An adverse chance is thus struck out. Dr. Bosanquet, to show that an inference may be obtained from two negative premisses, gives this illustration—'Light is not matter; light does not gravitate. Whence we infer that something which is not matter does not gravitate'. But he admits that either one premiss has become affirmative ('Light is not-matter'), or there is a *quaternio terminorum.*

§ 725. The rule against a syllogism having more than three terms is the one which seems to be more often violated in daily discourse than any other. See above, *Introduction*, § 13. What is more common than this kind of argument—'The clock struck eleven just now. I promised not to be late. You and I, then, must say farewell'? The reduction of the facts of actual speech to syllogistic form is practical Logic. No doubt the steps to be supplied in the process may be numerous, and 'It strikes eleven; I must be off' may grow into a chain of syllogisms. It is the commonest thing for an argument to seem to be without a middle term.

§ 726. Pairs of premisses in neither of which the middle term is distributed are often employed as *suggesting* material for thought, chiefly in the Second Figure. 'Are they Hebrews? So am I.' Because kings work hard and cobblers work hard we cannot conclude that kings are cobblers or cobblers kings. But it is instructive to know that both classes work hard, or live by

food and drink, or are mortal, or the like. If I am reminded that a philosopher is an animal and a rat is an animal, it comes home to me that they share a common animal nature. Shakespeare says

> The lunatic, the lover and the poet
> Are of imagination all compact—

which is more than a compendium of three propositions—

The lunatic is of imagination all compact.
The lover   ,,   ,,   ,,
The poet   ,,   ,,   ,,

It is not like—

> Great praise the Duke of Marlborough won,
> And our good prince Eugene.

The argument may be stated formally in an intensive form in Figure III

$$M\text{-ness is an attribute of } P$$
$$M\text{-ness is an attribute of } S.$$

Then one attribute at least of S is an attribute of P.

§ 727. Undistributed Middle is a besetting fallacy, as in the play—'Have you a strawberry-mark on your left arm? No! Then you are my long-lost brother!' The paralogism here (which may also be considered as two negative premisses) is so obvious that every one laughs. But if the argument had been Yes! instead of No! the conclusion would have been, in strict logic, just as inadmissible. It assumes—as, indeed, arguments with seemingly undistributed middle always really do—a convertible premiss—'My brother, and he only, has a strawberry mark on his left arm. You have one. Then you are he.' So in the *Comedy of Errors*—'My husband is of such a form. You are of such a form.' There are no exact replicas in human nature. Or if the mark were extremely rare, the inference ἐξ εἰκότων would be proportionately strong. Similarly, if almost every one possessed such a mark, the absence of it would be reasonable proof of identity.

§ 728. Certain principles about Conclusions will be obtained by a little thought. Thus, a conclusion cannot be affirmative if either premiss has been negative, or negative if both have been affirmative, or universal if either premiss has been particular.

§ 729. A distributed term is a term taken as to its entire extension. Let it now be noticed that

In *A* the subject is, the predicate is not, distributed,

In *O* the subject is not, the predicate is, distributed,

In *E* both are distributed,

In *I* neither is distributed,

(the contradictories herein being doubly contrasted).

Then, remembering the rule against two negative, or two particular, premisses, we observe that

If the premisses contain *one* distributed term between them, they must be *AI* (*IA*); from which the conclusion must be *I*.

If *two* between them, they must be *AA*, with conclusion *A* or *I*; or else *AO* (*OA*) or *EI* (*IE*); the conclusion from which must be *O*.

If *three* between them, they must be *AE* (*EA*), and yield an *E* or an *O* conclusion.

§ 730. We notice, then, that the premisses together have always at least one more distributed term than the conclusion. Which is also obvious from the fact that neither major nor minor term can be distributed in the conclusion unless it has been distributed in the premisses—else we should be arguing from part to whole—and that the middle term, which has at least one distributed term, has dropped out.

If a term has been distributed in the premisses it may always be distributed in the conclusion. For whatever has been said about it in its entire extension is entitled to a place in the inference drawn.[1]

§ 731. The attempt to distribute a term in the conclusion which has not been distributed in the premiss in which it occurred is called Illicit Process, either of the Major or of the Minor. The latter is the more venial error; for it only draws a universal in lieu of a particular conclusion ('Sylvia is both kind and fair; then beauty always dwells with kindness'). But the former draws a conclusion where none is admissible. E.g. 'Tables are articles of furniture; chairs are not tables; then chairs are not articles of furniture'.

§ 732. By the help of one or two of the foregoing rules, we are able to demonstrate that a true conclusion may be drawn from false premisses.

§ 733. For that falsity in *both* premisses does not necessarily

[1] *Bramantip* (All *P* is *M*, all *M* is *S*, therefore some *S* is *P*) really concludes universally about *P* rather than particularly about *S*.

involve falsity in the conclusion may be shown as follows :—
(1) If both premisses be affirmative, the denial of them will give
two negative premisses, from which nothing whatever can be
inferred. (2) If one premiss be affirmative and one negative,
denial gives us a negative and an affirmative premiss. In either
case the conclusion is negative. But one negative cannot con-
tradict another negative. *Example*—Oysters are nightingales.
Nightingales do not live in the woods. Then oysters do not
live in the woods.

§ 734. To prove the same thing where only one premiss is
false is less easy. *Example*—Three is four. Four is a number.
Then three is a number. But by inspection of the moods of
Figures I and II, shortly to be explained, we shall see that, if
either premiss be false, no conclusion whatever can be drawn.
And the same is found to be the case with most of the moods of
Figures III and IV. In the others, negation of either premiss
merely opposes ' Some S is P ' to ' Some S is not P '. But this
is no contradiction. The foregoing exercise may be recom-
mended to the student.[1]

§ 735. If, then, a conclusion is correctly drawn and true, the
premisses may either or both be false.

If it is correctly drawn and untrue, one or both of the pre-
misses must be false.

If it is incorrectly drawn, whether it be true or untrue, nothing
whatever can be said about the premisses.

If both premisses be true, a conclusion correctly drawn must
be true.

If either or both premisses be false, a conclusion correctly
drawn may or may not be true.[2]

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[1] Mr. St. George Stock kindly supplies me with the following suggested
proof :—

In a universal mood (concluding in A or E), if the contradictory
of either premiss be substituted for it, it can be shown that no conclusion
follows.   Therefore a universal conclusion cannot be thus destroyed.
In a particular mood (concluding in I or O), if the contradictory of either
premiss be substituted for it, it can be shown that the conclusion of the
new syllogism must be particular.   But one particular conclusion cannot
contradict another particular conclusion.

[2] See above, §§ 6, 31.   Aristotle observes : ἐξ ἀληθῶν μὲν οὖν οὐκ ἔστι
ψεῦδος συλλογίσασθαι, ἐκ ψευδῶν δ' ἔστιν ἀληθές, πλὴν οὐ διότι ἀλλ' ὅτι
(*An. Pr.* ii. 2, 53ᵇ7).   The conclusion is true in fact, but not by virtue of the
premisses.   From falsity truth may follow, but from truth truth only.

§ 736.　The truth of a Consequent does not necessarily involve the truth of the Antecedent, nor the falsity of an Antecedent the falsity of the Consequent.　Unless the antecedent is a *conditio sine qua non*.　But a conclusion can always be arrived at in more ways than one.　If it is false, says Aristotle, the grounds on which it rests must necessarily be false, in whole or part; but if true, it does not follow that they are in every, or even in any, part true.[1]

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[1] Φανερὸν ὅτι ἂν μὲν ᾖ τὸ συμπέρασμα ψευδές, ἀνάγκη, ἐξ ὧν ὁ λόγος, ψευδῆ εἶναι ἢ πάντα ἢ ἔνια, ὅταν δ' ἀληθές, οὐκ ἀνάγκη ἀληθὲς εἶναι οὔτε τι οὔτε πάντα (*An. Pr.* ii. 4, 57ᵃ36).

CHAPTER XXIII

MOOD AND FIGURE

§ 737. WE now proceed to consider what variations of mode or construction valid syllogistic inference can assume.

The arrangement of syllogisms according to the quantity and quality of the propositions of which they are composed is called *Mood*; while their arrangement according to the position in the premisses of the ground, or middle term, is called *Figure*. Figure, the skeleton of Syllogism, is really prior to Mood, which clothes it.

§ 738. Logicians usually set about the ascertainment of the valid Moods by finding what combinations are possible, and striking out those which transgress any of the rules of Syllogism. Thus—

The possible combinations of A, I, E and O in the three judgements of syllogism are 4 × 4 × 4 = 64. Of these only eleven are found not to offend, viz. AAA, AAI, AEE, [AEO], AII, AOO, EAE, EAO, EIO, IAI, OAO. [AEO] will be found always to conclude weakly in O when it might conclude in E.

The illegitimate Moods are as follows:—*Excluded for two negative premisses*—EEA, EEE, EEI, EEO, EOA, EOE, EOI, EOO, OEA, OEE, OEI, OEO, OOA, OOE, OOI, OOO.

Excluded for two particular premisses—IIA, IIE, III, IIO, IOA, IOE, IOI, IOO, OIA, OIE, OII, OIO.

Excluded for an affirmative conclusion after a negative premiss—AEA, AEI, AOA, AOI, EAA, EAI, EIA, EII, IEA, IEI, OAA, OAI.

Excluded for a negative conclusion from two affirmative premisses—AAE, AAO, AIO, IAO.

Excluded for a particular premiss followed by a universal conclusion—AIA, AIE, AOE, EIE, IAA, IAE, IEE, OAE.

Illicit process of the major—IEO.

Of course, some of these are condemned on more grounds than one.

§ 739. But further, in each of the above combinations the Middle Term may have one of four possible positions relatively to the extremes. It may be (1) subject of major and predicate of minor premiss ; (2) predicate of both premisses ; (3) subject of both premisses ; or (4) predicate of major and subject of minor premiss. These are the four Figures or *schemata*.

§ 740. There are not, however, 11 × 4 valid constructions. A mood which will stand in one figure may be invalid in another. There survive, if five moods with weak conclusions are admitted, six valid moods in each of the four figures. If the weak moods be struck out there remain nineteen possible constructions, viz. :—

In Figure I (SM, MP, SP)
              AAA   (*bArbArA*)
              AII   (*dArII*)
              EAE   (*cElArEnt*)
              EIO   (*fErIO*).
In Figure II (SM, PM, SP)
              EAE   (*cEsArE*)
              EIO   (*fEstInO*)
              AEE   (*cAmEstrEs*)
              AOO   (*bArOcO*).
In Figure III (MS, MP, SP)
              AAI   (*dArAptI*)
              AII   (*dAtIsI*)
              IAI   (*dIsAmIs*)
              EAO   (*fElAptOn*)
              EIO   (*fErIsOn*)
              OAO   (*bOcArdO*).
In Figure IV (MS, PM, SP)
              AAI   (*brAmAntIp*)
              IAI   (*dImArIs*)
              AEE   (*cAmEnEs*)
              EAO   (*fEsApO*)
              EIO   (*frEsIsOn*).

The Moods with weakened conclusions are—

Fig. I   AAI   (*bArbArI*), EAO   (*cElArOnt*)
Fig. II   EAO   (*cEsArO*), AEO   (*cAmEstrOs*
Fig. IV   AEO   (*cAmEnOs*).

The four first are sometimes called Strengthened Syllogisms because they assume more in the premisses than is necessary for proof of the conclusion, regarded as a *probandum*. But *Darapti, Bramantip* and *Fesapo* also do this.

The names in brackets will be explained below (§§ 764 seq.).

§ 741. But the same number of figured Moods is obtainable in a more satisfactory and scientific way by an *a priori* consideration of the nature of Inference.[1]

The fundamental basis of Rationality we saw (§§ 75 seq.) to be an assertion of the reality of law and truth. What holds in principle holds in fact. What is true in the abstract is true in the concrete. The rationally and theoretically asserted is, *in potentia*, asserted of actual things. A truth which is true *generaliter* is true (apart from counteraction) under any given circumstances. A bishop suffragan and an archbishop are both bishops. A dead coast-guardsman tells no tales because a dead man tells none. Experience consists of universals exhibited in differences, of form clothed with varying matter. The one persists through the many; the rule pervades every case or manifestation of it.[2] If when a statement had been made it eluded all application, there would be no such thing as coherence and consistency. M is P; then S, which is a case of M, must be P.

§ 742. This is so, whether 'M is P' (M is always P, Every M is P) implies a principle, a causal connexion, or is a concrete universal proposition arrived at by simple enumeration ('All the Apostles were Israelites': contrast 'All the Apostles were inspired)'. It is true also if M is an individual object—since every object persists through varying circumstances—, or if 'M is P'

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[1] McCosh, on the contrary, inquires: 'Can we determine what is the principle in the mind which regulates reasoning? The answer is that this can be done by carefully observing examples of valid reasoning, by ascertaining what is common to them all, and expressing this in a general formula.' He probably means that we should take illustrations of obviously valid inferences, and analyse them to detect the underlying law. But we cannot be certain that an inference is valid till it has been tested by that law. McCosh cannot intend that we are to find by experiment whether inferences correspond to facts, and so pronounce them valid. Were it so, ' Logic is Greek verse; Greek verse is a subject for examination; therefore Logic is a subject for examination' would be good reasoning.

[2] ' Logic is little more than an account of the forms and modes in which a universal does or does not affect the differences through which it persists ' (Bosanquet, *Logic*, ii. 3).

is a mere identification. In this case the inference is called *traductive*. In the following—'Richard's himself again; I am Richard; then I am myself again'—'himself again' must be regarded as conceptual.[1]

§ 743. That the Law of Rationality is ultimate is seen from this, that each syllogism is itself an application of it, being in fact the minor premiss of a great Syllogism.[2] 'This inference is a piece of ratiocination. All ratiocination is governed by the Law of Reason. Then this inference is governed by that Law.'

§ 744. The Canon of Syllogism, then, is this :—Whatever (P) can be affirmed (or denied) of a whole class (M) can be affirmed (or denied) of every member (S) of that class.

§ 745. But persistency has for its other side consistency. Accordingly another way of stating this Canon is that when anything (M) can be affirmed (or denied) of a class (P), but simultaneously cannot be affirmed (or denied) of another object or set of objects (S), the latter cannot be part of the former class. If P is M, anything which is not M cannot be P.

§ 746. In the language of Intension—Whatever (S) has certain attributes (M) has (or has not) the attributes (P) which invariably (or never) accompany them. And whatever (S) has (or has not) certain attributes (M) has not the attributes (P) which they never (or always) accompany.

M is always (never) P	P is always (never) M
S is M	S is never (always) M
Then S is always (never) P.	Then S is never P.

The *Dictum de diverso* clearly ranks on a level with the *Dictum de omni et nullo* (this expression, however, has regard to Extension). The latter is the principle of the First Figure. The former of the Second. Figure I states extensionally that if a term is included in another term it is included in any term in which *that* is included. Figure II states that if one term is included in, and another excluded from, a third term, they are mutually excluded.

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[1] A certain Pope desired a divided self-identity at his election. 'Get rid of the Sylvius,' he said, 'and keep the Pius.'

[2] Bosanquet condemns this as 'subsumption under the principle of Subsumption' (*Logic*, ii. 61). But Reason is none the less imperative for being an enormous *petitio principii*. Every question must ultimately be begged.

Figure I.	Figure II.
All birds have wings	All swans are graceful
A swan is a bird	A pelican is not graceful
Then a swan has wings.	Then a pelican is not a swan.

No swans are green	No swans are green
This bird is a swan	This bird is green
Then this bird is not green.	Then this bird is not a swan.

The Second Figure has as much right to be called 'perfect' and 'primary' as the First. They have an equal status.

The major premiss in Figure I may be affirmative or negative, but the minor premiss must be affirmative. In Figure II one premiss must be affirmative and the other negative—it does not matter which.

§ 747. In both Figures the major premiss must be universal; the minor may be either universal or particular. The quantity of the minor will always be reproduced in the conclusion. In Figure I the quality of the major will always be echoed in the conclusion; but moods in Figure II are bound to conclude negatively

§ 748. Representing P and not-P alike by Π, and 'Every S' and 'Some S's' alike by Σ, the norm of all inference in Figure I will be—

$$\text{Every M is } \Pi$$
$$\Sigma \text{ is M}$$
$$\text{Then } \Sigma \text{ is } \Pi.$$

Or, representing the judgement about M as J, we get

$$\text{M J}$$
$$\Sigma \text{ is M}$$
$$\text{Then } \Sigma \text{ J.}$$

Again, if μ be a common symbol for M and not-M, the norm in Figure II will be

$$\text{Every P is } \mu$$
$$\Sigma \text{ is not } \mu$$
$$\text{Then } \Sigma \text{ is not P.}$$

§ 749. Kant expresses the principle of Syllogism thus—'What stands under the condition of a rule stands under the rule'.[1] The corollary of which is that what does not stand under the rule does not stand under the condition of the rule. We cannot

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[1] *Logik*, § 57.

say that because anything does not stand under the condition of a rule it necessarily stands outside the rule ; nor yet that every-thing which stands under a rule stands under the condition of it.[1]

The former caution forbids a negative minor premiss in Figure I ; and the latter prevents any mood in Figure II (in which the middle term is always a predicate) from having two premisses of like quality. The following Syllogism has given trouble to logicians. 'A good pastor is prepared to give his life for his sheep. Few pastors of our day are prepared to do this. Then few pastors of our day are good pastors.' If 'few' meant 'a few' the minor premiss, like the major, would be affirmative, and the middle term undistributed. But 'few' means 'not many', and the minor premiss is negative.

Posit the condition, and the conditioned follows. This is Figure I. Sublate the conditioned, and the condition falls to the ground. This is Figure II. If X is Y, then so far as X is found (universal or particular minor premiss) Y is found ; and so far as Y is not found X is not found.

§ 750. We shall find that the existence of this twofold, instead of single, norm or type of Inference greatly simplifies reduction. A complementary relation of equality between the two aspects of Syllogism runs all through. They are not, however, dis-tinguishable as Affirmative and Negative, but rather as *Ponent* and *Tollent* Moods. We proceed to state them—

Figure I.	Figure II.
Barbara.	*Camestres.*
Every M is P	Every P is M
Every S is M	No S is M
∴ Every S is P.	∴ No S is P.
Darii.	*Baroco.*
Every M is P	Every S is M
Some S's are M	Some S's are not M
∴ Some S's are P.	∴ Some S's are not P.
Celarent.	*Cesare.*
No M is P	No P is M
Every S is M	Every S is M
∴ No S is P.	∴ No S is P.

[1] Ὅταν δύο ἔχῃ οὕτω πρὸς ἄλληλα ὥστε θατέρου ὄντος ἐξ ἀνάγκης εἶναι θάτερον, τούτου μὴ ὄντος μὲν οὐδὲ θάτερον ἔσται, ὄντος δ' οὐκ ἀνάγκη εἶναι θάτερον (Aristotle, *An. Pr.* ii. 4, 57ᵇ1).

Ferio.	*Festino.*
No M is P	No P is M
Some S's are M	Some S's are M
∴ Some S's are not P.	∴ Some S's are not P.

§ 751. We next consider whether there are any arguments which, though differently expressed, are easily convertible into any of the above. We notice, then, that, since 'Some S's are M' is the converse both of 'Every M is S' and of 'Some M's are S', these propositions may take its place wherever it occurs, viz. in *Darii, Ferio* and *Festino*. We also notice that 'No S is M' in *Camestres* may be replaced by 'No M is S'. Were we to make a similar change in the major premisses of *Celarent* and *Ferio*, respectively, we should merely get *Cesare* and *Festino* again, and vice versa. We have then seven new Moods, four *ponent* and three *tollent* :—

<table>
<tr><td>Figure III.</td><td>Figure IV.</td></tr>
<tr><td></td><td><i>Camenes.</i></td></tr>
<tr><td></td><td>Every P is M</td></tr>
<tr><td></td><td><i>No M is S</i></td></tr>
<tr><td></td><td>∴ No S is P.</td></tr>
<tr><td><i>Darapti.</i></td><td></td></tr>
<tr><td>Every M is P</td><td></td></tr>
<tr><td><i>Every M is S</i></td><td></td></tr>
<tr><td>∴ Some S's are P.</td><td></td></tr>
<tr><td><i>Datisi.</i></td><td></td></tr>
<tr><td>Every M is P</td><td></td></tr>
<tr><td><i>Some M's are S</i></td><td></td></tr>
<tr><td>∴ Some S's are P.</td><td></td></tr>
<tr><td><i>Felapton.</i></td><td><i>Fesapo.</i></td></tr>
<tr><td>No M is P</td><td>No P is M</td></tr>
<tr><td><i>Every M is S</i></td><td><i>Every M is S</i></td></tr>
<tr><td>∴ Some S's are not P.</td><td>∴ Some S's are not P.</td></tr>
<tr><td><i>Ferison.</i></td><td><i>Fresison.</i></td></tr>
<tr><td>No M is P</td><td>No P is M</td></tr>
<tr><td><i>Some M's are S</i></td><td><i>Some M's are S</i></td></tr>
<tr><td>∴ Some S's are not P.</td><td>∴ Some S's are not P.</td></tr>
</table>

The new minor premisses in the above are in italics.

§ 752. These are the fifteen Direct Moods. There are, however, certain Indirect Moods, in which the major premiss is

seemingly particular.   But in truth the conclusion is about P
rather than about S, a conclusion about S being obtained from
it by conversion.   In the above list of Moods the following have
a convertible conclusion—*Barbara, Darii, Datisi, Darapti,
Celarent, Cesare, Camestres, Camenes.*   But it is only the first
three affirmative ones which yield a new mood. *Darapti* remains
Darapti, Celarent becomes *Camenes* and *Cesare Camestres.*   The
conclusion of *Barbara* converts *per accidens,* and is weakened
in conversion.   The other two convert simply.   We thus get—
Indirect Moods (premisses transposed) :—

Figure III.
Disamis (Datisi).

> Some M's are P
> Every M is S
> ∴ Some S's are P (converted from Some P's are S).

Figure IV.
Bramantip (Barbara).

> Every P is M
> Every M is S
> ∴ Some S's are P (converted from Every P is S).

Dimaris (Darii).

> Some P's are M
> Every M is S
> ∴ Some S's are P (converted from Some P's are S).

§ 753. There is yet another possible way of obtaining Indirect
moods, viz. by getting a conclusion about not-P and then con-
verting and obverting it.   Only one new Mood, however, is
obtainable in this way, viz.

Figure III.
Bocardo (Datisi).

> Some M's are not P (are not-P)
> Every M is S
> ∴ Some S's are not P (obverted from Some S's are not-P,
> which is converted from Some not-P's are S).

Or else *Bocardo* may be regarded as simply *Disamis* with
not-P instead of P as major term. It may be questioned whether
such indirect Moods are admissible.   They represent perfectly
cogent arguments ; and we are entitled to ask, From what
affirmations involving S, P and M can a valid conclusion be

drawn? On the other hand, it may seem better to regard the four Indirect Moods merely as alternative forms of Direct Moods. *Bramantip* might be called *Barbarap, Dimaris Dariis,* and *Disamis Datisis.*

§ 754. The above account of the nineteen figured Moods is offered to the reader as more scientific, and far simpler, than the traditional system based on the sole supremacy of the First Figure. Apart from the Indirect Moods, the only manipulation required for reduction is conversion of the minor premiss of seven moods. *Camestres* and *Camenes* become direct moods, *Fesapo* and *Fresison* in Figure IV are seen to be natural arguments, and there is not the slightest trouble about *Baroco.* In any other plan O premisses have no legitimate place.

Nevertheless the familiar names of the Moods all imply a process of reduction to Figure I as the pure type of Syllogism. And the principle that a statement, affirmative or negative, made about a class generally is true of whatever may be found to be a member of that class, is so simple and all-sufficing that it is desirable to consider how the nineteen Moods can be obtained by a *ponent* system on the basis of the First Figure only.

§ 755. We have already seen that conversion of the minor premiss *per accidens* enables a mood *Darapti* to be reduced to *Darii* and a mood of the form *Felapton* to *Ferio* respectively; while two constructions, *Datisi* and *Ferison*, by simple conversion of the minor premiss, also become *Darii* and *Ferio.*

As regards the major premisses of Figure I, no proposition will convert to A; but E converts simply. Accordingly two moods in Figure II, *Cesare* and *Festino*, become by conversion of their major premisses *Celarent* and *Ferio* respectively.

Next, we try what conversion of both premisses will effect. It gives us two moods in Figure IV, either of which reduces to *Ferio*—

<div style="text-align:center">

Fesapo.
No P is M (= No M is P)
Every M is S (= Some S's are M)
∴ Some S's are not P.

Fresison.
No P is M (= No M is P)
Some M's are S (= Some S's are M)
∴ Some S's are not P.

</div>

§ 756. We next discover five Moods which yield a conclusion not directly but indirectly, by conversion of the direct conclusion. The premisses of these, therefore, will need transposition, if they are to be exhibited normally. For *Bramantip*, *Dimaris* and *Camenes* nothing more is wanted. They are merely *Barbara*, *Darii* and *Celarent* with converted conclusions. But a fourth converts to *Darii* by further converting its major premiss—

<div align="center">

Disamis.

</div>

Some S's are P = Some P's are M ⎱
Every M is S   ⎰ transpose.

∴ Some S's are P (converted from Some P's are S).

Disamis is merely *Datisi*, in the same Figure III, with converted conclusion. A fifth indirect mood converts to *Celarent* by converting its minor premiss—

<div align="center">

Camestres.

</div>

Every P is M   ⎱
No S is M = No M is S ⎰ transpose.

∴ No S is P (converted from No P is S).

Camestres is merely *Cesare* in the same Figure II with converted conclusion.

§ 757. There remain two Moods from which the disguise is removed by means of 'negative conception'. One, in the Second Figure, requires both premisses to be obverted, and the major then to be converted, when it is seen in that form to be the same as *Ferio*—

<div align="center">

Baroco.

</div>

Every P is M = No P is not-M = No not-M is P

Some S's are not M = Some S's are not-M

∴ Some S's are not P.

The other, in Figure III, is an indirect mood, requiring the premisses to be transposed, and the original major, but real minor, to be obverted and then converted. Finally, the conclusion has to be converted and then obverted. It then appears as *Darii*.

<div align="center">

Bocardo.

</div>

Some M's are not P = Some M's are not-P =
Some not-P's are M   ⎱
Every M is S   ⎰ transpose.

∴ Some not-P's are S = Some S's are not-P = Some S's are not P.

If *Felapton* were treated (which is unnecessary) in a similar manner, *Bocardo* would stand to it in the same symmetrical relation in which *Baroco* stands to *Camestres*.[1]

§ 758. It must be admitted that such reductions to a single norm of Syllogism appear clumsy and awkward, and give colour to the charge against 'the logicians' of seeking a false simplicity by the torturing of arguments into unnatural shapes. De Morgan affirms that 'Baroco and Bocardo do not admit of resolution to the first figure by any fair use of the phrase; but the logicians were determined they should do so'.[2]   Minto says :—'It may be conceded that the Aristotelian processes are artificial stages, courses that thought does not take naturally, but into which it has to be forced for a purpose.'[3]   Yet thought *does* take all these forms.   Our only question at this moment is whether it is natural to reduce them all to the type of Figure I.   When clothed with matter, the clumsiest reductions will often appear natural and easy.   Thus *Bocardo*—

Some beautiful things are not wholesome = Some unwholesome things are beautiful.

Every beautiful thing is pleasant.

Then some pleasant things are not wholesome (Some unwholesome things are pleasant).

Again, *Baroco*—

All who are able to enter the cavalry are well-to-do.

Some men of ancient birth are not well-to-do.

It follows that some men of ancient birth are unable to enter the cavalry.

But it is almost as simple to say in *Ferio*—

None but well-to-do men (no not-well-to-do men) can enter the cavalry.   Some men of ancient birth are not-well-to-do (far-from-well-to-do).   Therefore, &c.

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[1] *Camestres* and *Camenes* may also be reduced to *Celarent* by obversion (or permutation), and will then appear as *direct* Moods.   *Camestres* goes with *Baroco*, except that the minor premiss is universal.   In *Camenes*, the minor premiss has to be converted and then obverted, the major obverted and then converted :—

> Every P is M = No P is not-M = No not-M is P
> No M is S = No S is M = Every S is not-M
> Then, No S is P.

[2] p. 132.   [3] *Logic*, p. 39.

§ 759. The expansion of ' Some X's are Y ' into ' Some X's are
not not-Y ' is quite natural in such a phrase as ' Some afflicted
people are happy '—' are not unhappy '. 'Every one is glad '
and ' No one is otherwise than glad ' are equally plain.   It may
even be less natural to say ' Every X is Y ' than ' No not-Y is X '.
' All wise persons think so ' is more pointed in the form—' No
one who does not think so is wise '; and ' No tree that does not
bear fruit has stones flung at it ' conveys the intended moral
better, perhaps, than ' Every tree that has stones flung at it is
a fruit-bearing one '.   Instead of saying ' omne ens est corporale ',
Tertullian more clearly observes,—' nihil est incorporale nisi
quod non est ' (i. e. nullum non-non-ens est non-corporale—No
not-non-X is non-Y = Every X is Y).   Again, Juvenal's line,
' nec pueri credunt nisi qui nondum aere lavantur,' is at once
intelligible.   Yet when represented symbolically—No not-non-
YX's are Z—it seems roundabout and strained.   The Port
Royalists, however, point out that it is less natural to say, ' No
one who is to be believed is a liar,' than ' No liar is to be be-
lieved '. And, again, there is considerable risk, when obverting,
of confusion between contrary and contradictory.   We have
no logical right to assume that 'is not happy ' means 'is
unhappy '.

§ 760. It cannot on the whole be said that reduction of all
arguments to a single type is as natural or simple as reduction
to two equal types has been shown to be.

§ 761. Yet Thomson's ridicule of such a reduction from
Figure III to Figure I as this is surely undeserved.[1]

Darapti.	*Darii.*
Aristides was just	Aristides was just
Aristides was a pagan.	Some pagan was Aristides.
Therefore Some pagan was just.	

For ' some ' write ' a certain ', and the reduction is natural,
and also gives an instructive conclusion.   If I wished to show
that a pagan can be just, and were casting about for an example,
my thought would take this shape.   The conclusion is that a
case has occurred of a pagan being just.

§ 762. The object of Reduction is the exhibition of an argu-

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[1] *Laws of Thought*, p. 329.

ment in a clearer light—δεικτικῶς, to use Aristotle's word—by bringing to view the rational principle which governs it.

§ 763. We can now look at the mnemonic names by which the Moods are usually distinguished, as a guide for reducing to the First Figure. They are arranged in Latin hexameters. This ingenious aid to the memory is ascribed to Pope John XXI (Petrus Hispanus, 1226–77).[1] Negative moods are placed next to affirmative; though it has seemed to me above to be more instructive to put each mood with a particular minor premiss next to the corresponding universal mood. The lines are these—

Barbara, Celarent, Darii, Ferioque, *prioris*.
Cesare, Camestres, Festino, Baroco, *secundae*.
Tertia Darapti, Disamis, Datisi, Felapton,
Bocardo, Ferison *habet*. *Quarta insuper addit*
Bramantip, Camenes, Dimaris, Fesapo, Fresison.

§ 764. The vowels A, E, I and O are the propositional symbols. The initial letters indicate the mood in Figure I to which any mood is to be reduced. The consonants *s*, *p*, *m* and *c* are also significant. Thus, *s* means that the proposition (if a premiss) represented by the vowel after which *s* is placed must be converted *simpliciter*; while *p* shows that it is to be converted *per accidens*, or by limitation (Every X is Y ; Some Y's are X). When, however, *s* or *p* occurs at the end of a word, it is the *new* conclusion which has to be converted, not the original one. For what we do in reducing a mood to a type is to show that its premisses can be changed into the premisses of that type, the conclusion from which involves the conclusion of the reduced mood. When *m* occurs in a name, it indicates that the premisses must first

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[1] About the same time Nicephorus Blemmydes made an Ἐπιτομὴ λογικῆς, and in the margin of the MS. are written, probably by a later hand, certain Greek *voces memoriales* in imitation of *Barbara Celarent*. (See Ueberweg's *History of Philosophy*, i. 404.) Lines closely resembling those of the Spanish pontiff are traced to William of Shyrewode, chancellor of Lincoln, c. 1249, in which, however, the five Moods of the Fourth Figure are given as indirect Moods of the First. The final syllables of the first two lines are *metri causa* only, and Shyrwode indicates reduction *per impossibile* by *b* and *r* in the same word. The lines are these :—

> Barbara, Celarent, Darii, Ferio, Baralip-ton,
> Celantes, Dabitis, Fapesmo, Frisesom-orum.—
> Cesare, Campestres, Festino, Baroco,—Darapti,
> Felapton, Disamis, Datisi, Bocardo, Ferison.

be transposed (*mutare*).   The letter *c* will be explained in the
next section.

Example—*Disamis* (Fig. III) to *Darii*.

Some M's are P, converted simply = Some P's ⎫
   are M   ⎬ transpose.
Every M is S   ⎭

Then, Some S's are P, converted simply from Some P's are M.

E. g.—'Some tigers are man-eaters ; all tigers are large cats ;
then some large cats are man-eaters' becomes—'All tigers are
large cats ; some man-eating animals are tigers ; therefore some
man-eating animals are large cats (= Some large cats eat men).'

Again, *Fesapo* (Fig. IV) to *Ferio*.

No P is M, converted simply = No M is P.
Every M is S, converted *per accidens* = Some S's are M.
Then, Some S's are not P.

§ 765. All other reduction is direct and *ostensive*.   But *Baroco*
and *Bocardo* can only be reduced to the First Figure indirectly,
viz. by reduction, if the conclusion be denied, to an absurdity—
reductio per impossibile—unless we employ the method already
indicated of Reduction by Obversion and Conversion.   The
letter *c* (sometimes written *k*) indicates that the contradictory of
the questioned conclusion is to be substituted for the premiss
after which *c* is placed.   This is in both cases O.

Combining the new premiss, then, with the other one, we pro-
ceed in Figure I to draw a new conclusion. As this will be found to
contradict the displaced premiss, which is confessedly true, the
premiss substituted for it must be false.   For it cannot be the
other premiss which is false, since this was one of our original
data.   Therefore (since a false conclusion cannot be drawn from
two true premisses) the falsity must lie in the substituted pre-
miss.   In other words, the original conclusion, of which it is the
contradictory, must be true.   Thus—

<div align="center">

Baroco.

Every P is M
Some S's are not M
Then, Some S's are not P.

</div>

Suppose this conclusion false.   Then it must be true that
Every S is P.   Combine this proposition with the original major

so as to form a syllogism in the admittedly perfect Figure I. The new syllogism will be—

> (*Barbara*).
> Every P is M
> Every S is P
> Then, Every S is M.

But it was conceded that Some S's are not M (the old minor premiss). The new conclusion, then, is false. And if so, one at least of the premisses on which it is grounded must be false (see above, § 735). It cannot be the major—Every P is M. Then it must be the other—Every S is P. But if this is false, its contradictory, our original conclusion, Some S's are not P, must be true.

> Again, *Bocardo*.
> Some M's are not P
> Every M is S
> Then, Some S's are not P.

Suppose this untrue. Then it must be true that Every S is P. Substitute this for the old major premiss—

> (*Barbara*).
> Every S is P
> Every M is S
> Then, Every M is P.

But it was agreed that some M's are not P. The new conclusion then is false, and it must be untrue that Every S is P.

§ 766. *Baroco* and *Bocardo*, it must be said, are the worst illustrations possible of the method of *reductio ad absurdum*. For indirect proof of these two moods could not be obtained if it were the O premiss which was left in and the other taken out. For O cannot stand as a premiss in the First Figure. *Baroco* would become by 'internal reduction' *Bocardo* and *Bocardo Baroco*, and so there would be no reduction to Figure I. Yet it should be observed that these moods are not really themselves reduced to Figure I, so as to exhibit the rationality of their construction in the form *Barbara*, but are only proved by means of *Barbara*. The Port Royal Logic complains of Euclid's excessive use of *reductio ad absurdum* (Pt. iv. ch. x). Such proof may convince the mind, but does not enlighten it

§ 767. The principle of *deductio ad* (or *reductio per*) *impossibile*

is capable of universal application ; and by this method a mood in any Figure can be reduced to a mood or moods in some other Figure, supposed admittedly valid.   To show this, except in an Appendix,[1] would be tedious, but two examples are offered—

Darii.	*Camestres.*
Every Y is Z	Every Y is Z
Some X's are Y	No X is Z
∴ Some X's are Z	No X is Y.

Celarent.	*Disamis.*
No Y is Z	Some X's are Z
Every X is Y	Every X is Y
∴ No X is Z	Some Y's are Z.

§ 768. As regards *Baroco* and *Bocardo*, the difficulty about ostensive reduction of these two moods to Figure I is that in *Baroco*—the middle term being undistributed in the major premiss—it is not at first clear where the rule lies ; while in *Bocardo*—since ' Some M is not P ' will not convert as ' Some P is not M '—we are at a loss for a subsumption under the rule, which must be looked for in the minor premiss.

§ 769. We have seen by what rules every one of the nineteen Moods may be reduced to the First Figure, based on the Principle of Identity.   The possibility of such reduction may seem to establish the pre-eminence of that Figure.   But it is equally possible to reduce all the Moods to the type of the Second Figure, based on the Principle of Contradiction.

It has been shown above (§ 751) that *Camenes, Fesapo* and *Fresison* (Fig. IV) reduce to this type by conversion of the *minor* premiss.

The other negative direct Moods are, in Figure I, *Celarent* and *Ferio*, which reduce to *Cesare* and *Festino* respectively by simple conversion of the *major* premiss ; and, in Figure III, *Felapton* and *Ferison*, which reduce to *Festino* by conversion of *both* premisses.

§ 770. It may be thought that considerable violence will have to be offered to the Moods in which both premisses are affirmative to bring them into line with those which express *repugnance*. But the direct Moods in Figure I require no change beyond

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[1] See Appendix E.

conversion by negation[1] (obversion—conversion) in the major premiss. The conclusion must be obverted. Thus—

> *Barbara* becomes *Cesare*.
> Every M is P = No not-P is M
> Every S is M
> ∴ Every S is P (No S is not-P).

Example :—

Those who have suffered are sympathetic = The unsympathetic have not suffered.

Every woman has suffered.

Then (*non ignara mali*) every woman is sympathetic (No woman is unsympathetic).

Darii similarly reduces to *Festino*. In Figure III the direct affirmative Moods, besides conversion by negation in the major, require conversion of the minor, premiss. Thus—

> *Darapti* becomes *Festino*.
> Every M is P = No not-P is M
> Every M is S = Some S's are M
> ∴ Some S is P (Some S's are not not-P).

Datisi reduces to *Festino* in the same way.

§ 771. There remain the indirect Moods, *Disamis, Bocardo, Bramantip* and *Dimaris*. In these the premisses must be transposed. Then *Bocardo* becomes *Festino* by obversion followed by conversion in both premisses, while the conclusion is reached by obversion, followed by conversion, followed by obversion again—this threefold process is called contraposition[2]—, of the conclusion of *Festino*. Thus—

> Transpose { Some M's are not P = Some not-P's are M
> { Every M is S = No not-S is M
> ∴ Some S's are not P (Some not-P's are not not-S,
> = Some not-P's are S, = Some S's are not-P,
> = Some S's are not P).

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[1] This name (applied also to conversion—obversion) seems less suitable in dealing with negative propositions.

[2] In Contraposition the terms are transposed and their quality changed, that of the proposition itself being unchanged. Thus, 'Every X is Y' becomes by contraposition 'Every not-Y is not-X'. 'No X is Y' becomes 'Some not-Y is not not-X'. 'Some X is not Y' becomes 'Some not-Y is not not-X'. Particular affirmative propositions do not admit of contraposition. Conversion—obversion—conversion (Keynes's 'Inversion') is only possible with E judgements.

Example :—

Some good men are not wise = Some unwise men are good.

Every good man is well-intentioned = No one who is not well-intentioned is good.

Then, Some who are well-intentioned are not wise (reached thus —Some unwise men are not otherwise than well-intentioned = Some unwise men are well-intentioned = Some well-intentioned men are unwise = Some well-intentioned men are not wise).

There is nothing very far-fetched in this. *Disamis* also becomes *Festino* in the same way, except that the apparent major premiss merely wants converting.

The two Fourth Figure Moods, *Bramantip* and *Dimaris*, reduce to Figure II by conversion by negation in the apparent minor premiss. The conclusion is reached in either case by obversion followed by conversion. Thus—

Bramantip.

Transpose $\begin{cases} \text{Every P is M} \\ \text{Every M is S = No not-S is M} \end{cases}$

∴ Some S's are P (No P is not-S = Every P is S, converts *per accidens* to Some S's are P).

Dimaris.

Transpose $\begin{cases} \text{Some P's are M} \\ \text{Every M is S = No not-S is M} \end{cases}$

∴ Some S's are P (Some P's are not not-S = Some P's are S = Some S's are P).

These reducts are *Cesare* and *Festino* respectively. But it must be observed as regards all the affirmative Moods reduced to Figure II that the negative conclusion is directly about the relations, not of S and P, but of S and not-P or of P and not-S. *Bramantip* in fact can be reduced to *Camestres* without transposition of premisses, the conclusion being No not-S is P, = No P is not-S, = Every P is S, which converts *p.a.* to Some S's are P.

§ 772. Enough has been said to show that there are in Logic, as in England, two primacies rather than one, and that the First Figure has only a precedence of honour over the Second. Given a rule, then wherever the condition is fulfilled the rule applies, and wherever the rule does not apply the condition is not fulfilled. *Repugnans notae est repugnans rei ipsi.*

§ 773. It is possible, indeed, to reduce all the Moods of the First or Second Figure except *Barbara* to Moods of the Third or Fourth Figure. Thus *Darii* by a trifling change can be exhibited as *Datisi* (Fig. III), and, by transposition of premisses, as *Dimaris* (Fig. IV). *Ferio* easily glides into *Fresison* (Fig. IV). *Celarent* can be reduced to *Camenes* (Fig. IV). Again, of Moods in the Second Figure, *Camestres* and *Cesare* will reduce to *Camenes*. *Festino* reduces by conversion of one premiss to *Fresison* (Fig. IV), and of both to *Ferison* (Fig. III). *Baroco*, made amenable by obversion, can be exhibited in the construction *Fresison*. Finally, four Moods of Figure IV can be reduced to Figure III, viz. *Bramantip* and *Dimaris*, if the premisses be transposed, to *Datisi*, *Fesapo* to *Felapton* and (less easily) to *Darapti*, and *Fresison* to *Ferison* and (with some pressure) to *Disamis* or *Bocardo*. But *Camenes*, having a universal conclusion, refuses to be so treated. Reduction from one imperfect Figure to another is called by Stock Transverse or Cross-reduction. Neither the Third nor the Fourth Figure can be regarded as a type or norm.

§ 774. The expressions Major, Minor and Middle have reference originally to the First Figure. The Major Term (τὸ μεῖζον) and the Minor Term (τὸ ἔλαττον) are so called because in *Barbara*—leaving identifications on one side—the one has a larger and the other a smaller extension. The minor term is there 'wholly in' the middle, and the middle 'wholly in' the major. Such, Aristotle says, necessarily constitutes a perfect corrationalizing (συλλογισμός) of the extremes.[1]
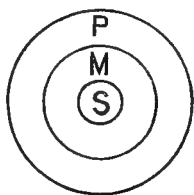
But there is no other Mood in Figure I in which we can tell whether major or minor term has the larger extension. E and O are exclusive. I merely affirms that the two spheres partly

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[1] Ὅταν ὅροι τρεῖς οὕτως ἔχωσι πρὸς ἀλλήλους ὥστε τὸν ἔσχατον ἐν ὅλῳ εἶναι τῷ μέσῳ καὶ τὸν μέσον ἐν ὅλῳ τῷ πρώτῳ ἢ εἶναι ἢ μὴ εἶναι, ἀνάγκη τῶν ἄκρων εἶναι συλλογισμὸν τέλειον (*An. Pr.* i. 4. 25^{b}32). ἔσχατον and πρῶτον seem to refer to the order of the premisses in the usual Greek form—' P is preicdated of M, M of S '. κατηγορεῖται κατά should be the form for judgement in intension, ἐν ὅλῳ ἐστι for judgement in extension. But Aristotle uses the two expressions in the same sense (*An. Pr.* i. 1, § 8).

coincide. When the syllogism is expressed in intension, the major term of *Barbara* will be the least (see below, p. 571).

§ 775. The Major Premiss is that which contains the Major Term; the Minor Premiss is that in which the Minor Term occurs. In speaking of the Indirect Moods, however, I have spoken of the 'apparent' major. For these moods are really inverted. The true major premiss in thought must be that which states the rule or principle. So in common speech—"I deny your major"—referring to some general assertion under which a case is to be brought.

§ 776. The Middle Term was partly so called from its position in the First Figure, as enunciated by the Greeks, SM, MP; therefore SP. Aristotle, however, also calls it by this name because it 'is both in another and another in it'.[1] But this is only true of *Barbara*. The expression 'middle term,' however, has a significance which is not merely technical, nor confined to a single type of reasoning. For all argumentation is essentially mediate; and we can never judge P of S without an intermediary ground.

§ 777. The honour traditionally paid to the First Figure was connected with the conception, already several times mentioned, of a fixed subordination of concepts, each having a natural predicate in the concept just above it. 'The first figure,' says Dr. Wallace, ' as corresponding more than other figures with the natural order of phenomena, because its middle term really lies *between* the two extremes, is regarded by Aristotle as the typical form of syllogistic reasoning, and as therefore pre-eminently cogent and conclusive.'[2] The Second Figure gives only negative conclusions, the Third only particular. The First alone, in *Barbara*, enables universal affirmative inferences to be drawn, and so is regarded as the scientific figure.[3] To reduce a mood to it is to show that the conclusion holds if the premisses are stated in the construction of Figure I.

§ 778. Something further should be said about certain special features of the Four Figures.

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[1] Καλῶ δὲ μέσον ὃ καὶ αὐτὸ ἐν ἄλλῳ καὶ ἄλλο ἐν τούτῳ ἐστίν, ὃ καὶ τῇ θέσει γίνεται μέσον (*An. Pr.* i. 4. 25ᵇ35).

[2] *Outlines*, p. 39.

[3] Τὸ μὲν οὖν καταφατικὸν τὸ καθόλου διὰ τοῦ πρώτου σχήματος δείκνυται μόνου, καὶ διὰ τούτου μοναχῶς (*An. Pr.* i. 26. 42ᵇ32).

Figure I 359

Figure I.

Whatever is predicated of a term distributed affirmatively or negatively may be predicated likewise of everything contained under it. Aristotle's short Canon is this—'Whatever is stated of the predicate will be stated also of the subject'. What is in the contained is in the containing. This formula of Buffier's will cover the intensive as well as the extensive aspects of syllogism, and give a particular as well as a universal conclusion.

This Figure exhibits the bringing of case under rule. But such subsumption cannot take place unless what is said about the middle term, whether affirmatively or negatively, be said about the whole of it. The major premiss, then, must be A or E. And subsumption must be an assertion, not a denial. Otherwise we get irrelevance and disconnexion. Accordingly the minor premiss, whether universal or particular, must be affirmative— that is, either A or I. In this Figure, then, there can be no place for O premisses.

§ 779. Whatever be the quality of the major premiss will be the quality of the conclusion. And whatever be the quantity of the minor premiss will be the quantity of the conclusion. But the latter rule requires to be guarded. The quantity of the conclusion is thought as a *minimum*, even when stated in the minor premiss as a *maximum*. Thus—'All kings eat ; *only one* man in England is a king'—we do not conclude that only one man in England eats, but that one man *at least* does so. Again, 'Few Chinamen are Christians. All Christians are bipeds'; then *a few* (*at least*), not *few*, Chinamen are bipeds.

Of course, such conclusions are absurdly inadequate, the fact being that quantification expressed with a limitation—'only sometimes', 'just fourteen,' 'less than half,' 'scarcely a tenth'— is of the nature of an O judgement—a *minus* quantification— and has its natural place as the *negative* premiss of an argument in Figure II. Thus—

All who are in earnest signed the paper.

Only a few (or, not more than nine) signed the paper.

Then only a few (or, not more than nine) are in earnest.

§ 780. The quantity of the minor premiss in Figure I might be filled up with any number. 'Those who were there had a happy day. Seven were there. Then seven (at least) had a happy day.' But the specified figure cannot be zero. For

nought is in itself a limitation ; and 'none at least' in a conclu·
sion would be meaningless.

The exception to the above is when the major premiss is
understood as a convertible proposition. In that case the limi-
tation reappears in the conclusion. Thus—'All who signed
the paper are in earnest' probably implies that all who are in
earnest signed the paper. 'Only nine signed it. Then only
nine are in earnest.' But this, we have seen, is really an argu-
ment in Figure II.

Figure II.

§ 781. ' So far as an attribute is affirmed of one class and denied
of another, those two classes exclude one another.' What is not in
the containing is not in the contained (*Camestres, Baroco*). What is
in the not-containing is not in the non-contained (*Cesare, Festino*).

In this Figure the middle term is taken twice as attribute, once
affirmatively and once negatively.

Francis Quarles thus quotes St. Ambrose (*De Virg.* lib. iii)—
' Christ is not in the market nor in the streets. For Christ is
peace, in the market is strife ; Christ is justice, in the market
is iniquity ; Christ is a labourer, in the market is idleness ;
Christ is charity, in the market is slander ; Christ is faith, in
the market is fraud.'

§ 782. If Figure I answers to the *ratio essendi*, Figure II sets
forth the *ratio cognoscendi* in its negative and only cogent form,
of denial that a mark is present in a particular case.

This is the figure of Comparison. Agreement (unless our
premiss states a *proprium*) proves nothing ; only disagreement.

> A gentleman acts considerately.
>
> X does not act considerately.
>
> It follows that X is not a gentleman.

A fuller form of the argument is this :

> Every A is both B and C ;
>
> D is B but not C (or, is C but not B).
>
> Then D is not A.

Example (see Leviticus xi)—

A clean beast is one which chews the cud and divides the hoof.

The camel cheweth the cud but divideth not the hoof; he is
unclean unto you.

The swine, though he divide the hoof, yet he cheweth not
the cud ; he is unclean unto you.

Minto well calls this the figure of Negative Diagnosis.[1] A physician concludes from the absence of a symptom. This patient is not suffering from scarlet fever, for he has no sore throat. The Second Figure, then, is the basis of Induction, and is the form taken by the Method of Exclusions. Two affirmative premisses, the agreement of two objects in some characteristic, will help but little towards an Induction. Nevertheless, such a construction is often adopted to show that two objects—they cannot be regarded as subject and predicate—have something in common; as when the unwieldy knight writes to Mistress Page :—

'You are not young,—no more am I—go to, then, there's sympathy. You are merry; so am I—ha! ha! then, there's more sympathy. You love sack, and so do I—would you desire better sympathy?' We say epigrammatically of two people who commit the same fault, 'It is six of one and half a dozen of the other' (C'est bonnet blanc et blanc bonnet). See also Eccles. iii. 19.

But when Bertalda is known to be the fisherman's daughter by the marks on her left instep and shoulders, or Ulysses is recognized by the nurse by the scar from the boar's tusk, the major premiss is really, '*Only* she (or he) could be so marked.'

Figure III.

§ 783. In this Figure two statements are made about the same subject. If any subject is said to have two attributes (A is both B and C), those attributes are thereby seen to be at least sometimes found in combination. 'Grote was a banker—Grote was a man of letters. Then a banker may be a man of letters.' Or if it has one attribute and lacks another (A is C but not B), the former attribute is seen not necessarily to carry with it the latter. 'Two terms which contain a common part partly agree; or, if the one contain a part which the other does not, they partly differ.' But in this formula 'contain a part' must be understood in extension; and 'agree' and 'differ' must mean coincide and the reverse in sphere.
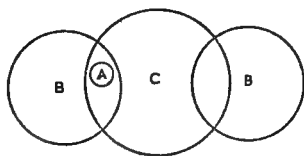
Or thus—'If two classes contain the same thing—the one wholly, the other wholly or in part, then they partially coincide'.

[1] *Logic*, p. 200.

But for this formula to cover negative moods, it must be possible for one of the containing classes to be negative.

§ 784. In this Figure the minor premiss must always be affirmative, and the conclusion particular.   An argument in Figure III may seem to have two negative premisses—M is not P, M is not S.   But the conclusion here is about not-S—Some not-S is not P.   As regards the particular conclusion Sigwart observes :—

'The particular judgements of fig. 3 differ essentially from those of figs. 1 and 2.   In the latter the term which is particular stands from the first as subject, and the fact that it is particular is unimportant, may indeed be due merely to the verbal expression ; the subjects of the minor premiss and of the conclusion are the same.   But in the third figure the particular term is subject only in the conclusion, and possesses therefore all the indefiniteness of the particular.   It is equivalent to a mere judgement of *possibility* ; and in the third figure there can be no such thing as a necessary consequence in the ordinary sense.'[1]

§ 785. The conclusion, in other words, is essentially, and not accidentally, particular.   The two predicates, we judge, are not necessarily incompatible, or are not necessarily connected. S may be P.   S is not obliged to be P.   So that *Datisi* is not, except in form, a subordinate mood to *Darapti*, nor *Ferison* to *Felapton*, in the same way that *Darii* in Figure I stands under *Barbara* and *Ferio* under *Celarent*.   For the subsumption can *never* be universal, the A minor premiss of *Darapti* having to be converted to I before case can be brought under rule.

§ 786. Not concluding universally, the Third Figure is commonly employed to establish an objection to a too sweeping statement.   A is confronted with O and E with I.   Thus, if it be asserted that no good man ever practises deception, it might be replied (*Darapti*) that all anglers practise deception, and that anglers are invariably good men.   An unqualified statement can be upset by a single *instantia*.   The argument from Analogy is often of this kind ; and accordingly the principle underlying Figure III is called the *Dictum de Exemplo*.   'So-and-so of our College won the Newdigate, and also took a First Class in Mathematics.   This shows that mathematicians sometimes are poets.'

§ 787. Identifying judgements with a singular subject are

[1] *Logic*, i. 355.

Figure IV 363

usually in this Figure. Thus—' Wellington was the victor at Waterloo. Wellington was our greatest commander. It follows that it was our greatest commander who was the victor at Waterloo.'

Figure IV.

§ 788. ' If any class is wholly or partly contained in another class which is wholly contained in a third class, some of the members of this last class have the characteristics of the first class.' But this formula needs some restatement for the nega· tive moods. This much derided *schema* is required for logical symmetry, since Figures are distinguished by the position of the middle term ; and we have not yet considered the case of premisses which have the middle term as predicate of the major and subject of the minor. The more or less of utility possessed by any arrangement of terms is not the question. Logic is not a mere Art. We have to inquire what forms of argument have rational cogency. Moreover, in view of the endless variations of shape which thought actually takes, the charge of uselessness should not be too quickly accepted. It all depends on what point we are interested in establishing. The following, for instance, is in *Camenes*—

The man wanted by the police is a criminal ; no criminal lives in our court ;

It follows that no one who lives in our court is the man wanted by the police.

And this is in *Bramantip*—

Swordsmanship is a noble accomplishment.

All noble accomplishments ought to be practised by you.

Then one of the things you ought to practise is swordsmanship. Or the question may arise, how to get at a secret. The following is *Fesapo*—

Philip never exceeds ;

But *in vino veritas* ;

Then one way of getting at the truth is not to be hoped for from Philip.

Bain, speaking of an indirect Mood, *Disamis*, in Figure III, gives as example—

Some men are kings ;

All men are fallible beings ;

Then some fallible beings are kings.

Substitute for 'kings' 'invested with Divine authority', and the argument will be a usual and instructive one. A similar argument in *Dimaris* (Fig. IV) is equally to the point—

Some persons invested with authority are parents.

All parents are fallible.

Then some fallible persons are invested with authority.

This answers a question which has often been debated.

Another example of *Dimaris* might be this—

Men of genius sometimes commit crime.

Those who commit crime find their way to prison.

Then some who find their way to prison are men of genius.

In Figure I the mind would be directed to the question, What happens to men of genius? In Figure IV, the question is rather, What kinds of men get into prison? If one went through the cells, whom would one find there?

§ 789. The Fourth Figure is not mentioned by Aristotle, who, attending only to the possible combinations of premisses, without reference to the conclusion, regarded the Middle Term as occupying one of three positions. It might stand (1) *above* both premisses, i. e. be predicate of both; (2) *below* both premisses, i. e. be subject of both; or (3) *between* the premisses, i. e. be subject of one and predicate of the other.[1]

§ 790. When we think, however, of the premisses in connexion with the conclusion to be drawn from them, it cannot be left undetermined which is the major (i. e. contains the major term, or predicate of the conclusion), and which is the minor (i. e. contains the subject of the conclusion). Or, if we have the premisses and the conclusion is not yet drawn, then, according as the middle term is predicate of the one premiss or of the other, the conclusion can be drawn in two different ways. The arrangement is not 'fortuitous and arbitrary', as Veitch[2] maintains.

§ 791. McCosh states an objection to the Fourth Figure thus—

'In the minor premiss S, the predicate, is more extensive than M, the subject; and in the major premiss M, the predicate, is more extensive than P. But in the conclusion we find S, the

---

[1] These are not the precise expressions of Aristotle, who says of Figure II : τίθεται τὸ μέσον ἔξω μὲν τῶν ἄκρων, πρῶτον δὲ τῇ θέσει (*An. Pr.* i. 5, § 1), and of Figure III : τίθεται τὸ μέσον ἔξω μὲν τῶν ἄκρων, ἔσχατον δὲ τῇ θέσει (*An. Pr.* i. 6, § 1).

[2] *Institutes*, p. 396.

Figure IV 365

more extensive, the subject, and P, the less extensive, the predicate, which is not agreeable to spontaneous thought, and should not have a place in reflective thought.'[1]

If the conclusion were about *all* S's this would be a valid objection. But it is about *some* S's. The extension, then, of S and P in the conclusion cannot be compared. The only mood in Figure IV with a universal conclusion is *Camenes*, which is negative. It might as well be objected to *Darapti* that its middle is less extensive than its minor term, or against *Camestres* and *Baroco* that their major is less extensive than their middle term.

§ 792. Hamilton derides this Figure as a hybrid. Its premisses are in Intension, its conclusion in Extension. He should have said that, while the minor term is in the premiss intensive but in the conclusion extensive, it is just the opposite with the major term.

But this indictment is really directed against all Indirect Moods, and holds good, not only against *Bramantip* and *Dimaris*, but against *Disamis* and *Bocardo* also.

§ 793. It is the rugged anfractuosities of *Bramantip* which excite so much wrath against the Fourth Figure generally. That luckless mood seems to combine all syllogistic weaknesses, as *Barbara* all syllogistic virtues. *Bramantip* is anti-*Barbara*, *Barbara* topsy-turvy.

Camenes, however, we have seen to be a perfectly respectable Mood, on the lines of Figure II. If reduced, it is true, to the First Figure, it must be regarded as an indirect Mood. On the other hand, this cannot be alleged against *Fesapo* and *Fresison*. No transposition of premisses is possible in dealing with these two.[2] Yet scarcely a logician but has thrown a stone at them as at the others, on the alleged ground of their being merely moods of Figure I in the disguise of a transposed arrangement. Thus Bain says :—

' The modes of the Fourth Figure are, with the appearance of great inversion, mere varieties of the primary Figure. The transposition of the order of the premisses is the most insignificant of all the alterations made on a syllogism. It signifies nothing to the reasoning in what order the premisses are stated.'[3]

---

[1] *Laws of Discursive Thought*, pp. 133, 134.

[2] They would be indirect Moods if reduced to AEO and IEO in Figure I ; but those syllogisms are invalid.

[3] *Logic*, Pt. I, p. 145.

And meanwhile *Disamis* and *Bocardo*, which are really guilty in this matter, are allowed to pass unreproved. If *Fesapo* and *Fresison* are indeed First Figure moods upside-down, where is the tell-tale *s* or *p* after their last syllable ?[1] *Bocardo*, it is true, is without such a mark.   But logicians have given it a treatment all to itself.

§ 794. It must be repeated that the real *gravamen* is not against the Fourth Figure in itself, but against the Indirect or Inverted Moods in the two last Figures—*Disamis, Bocardo, Bramantip* and *Dimasis*.

§ 795. Kant attacked the distinction of Figures.   But that distinction exists in the structure of human thought.   Reason on the other hand is one.   Logic exhibits the unity of Reason in the diversity of Thought—it cannot be said that there is no unity to be exhibited.   Each Figure has its own use.   Yet we have shown that not all are normal ; but that the last two Figures are subordinate to, and resoluble into, the two first.

[1] Bain says that *Fesapo* and *Fresison* ' present both premisses converted ; and the first of the two is superfluous, even as a form ' (*loc. cit.*). But why more superfluous than *Darapti*, which yields the same conclusion as *Datisi* or *Disamis* ?

CHAPTER XXIV

MOOD AND FIGURE (*continued*)

§ 796. THE two syllogistic types may be represented in this categorical form—

Ponent.	*Tollent.*
Y is Z	Y is Z
X is Y	X is not Z
∴ X is Z.	∴ X is not Y.

Or in semi-conjunctive form thus—

If X is Y, X is Z If X is Y, X is Z
X is Y X is not Z
     ∴ X is Z.   ∴ X is not Y.

If the condition is fulfilled the rule applies. If the rule does not apply, the condition is not fulfilled.

§ 797. The following Conspectus of figured forms of argument is based on this double principle. But it has to make room for the *partial* fulfilment of the condition and the partial non-application of the rule (Particular Judgements); and also for a negative equally with a positive rule.

Direct Moods (15).

I (Figs. I and III).—Condition fulfilled (carrying with it the assertion of the rule's application).

Universally (entire affirmation of the antecedent)
{
     Positive rule
         (Fig. I) *Barbara,* Y is Z, X is Y; ∴ X is Z.

     Negative rule
         (Fig. I) *Celarent,* Y is not Z, X is Y; ∴ X is not Z.
}

Particularly (partial affirmation of the antecedent)

> *Positive rule*
>> (Fig. I) *Darii*, *Y* is *Z*, Some *X* is *Y*; ∴ Some *X* is *Z*.
>>
>> (Fig. III) *Darapti*, *Y* is *Z*, *Y* is *X*; ∴ Some *X* is *Z*
>>> (minor pr. converted *p*).
>>
>> (Fig. III) *Datisi*, *Y* is *Z*, Some *Y* is *X*; ∴ Some *X* is *Z*
>>> (minor pr. converted *s*).
>
> *Negative rule*
>> (Fig. I) *Ferio*, *Y* is not *Z*, Some *X* is *Y*; ∴ Some *X* is not *Z*.
>>
>> (Fig. III) *Felapton*, *Y* is not *Z*, *Y* is *X*; ∴ Some *X* is not *Z*
>>> (minor pr. converted *p*).
>>
>> (Fig. III) *Ferison*, *Y* is not *Z*, Some *Y* is *X*; ∴ Some *X* is not *Z*
>>> (minor pr. converted *s*).

II (Figs. II and IV).—Rule not applying (carrying with it the non-fulfilment of the condition).

Universally (entire denial of the consequent)

> (Fig. II) *Cesare*, *Z* is not *Y*, *X* is *Y*; ∴ *X* is not *Z*.
>
> (Fig. II) *Camestres*, *Z* is *Y*, *X* is not *Y*; ∴ *X* is not *Z*.
>
> (Fig. IV) *Camenes*, *Z* is *Y*, *Y* is not *X*; ∴ *X* is not *Z*
>> (minor pr. converted *s*).

Particularly (partial denial of the consequent)

> (Fig. II) *Festino*, *Z* is not *Y*, Some *X* is *Y*; ∴ Some *X* is not *Z*.
>
> (Fig. II) *Baroco*, *Z* is *Y*, Some *X* is not *Y*; ∴ Some *X* is not *Z*.
>
> (Fig. IV) *Fesapo*, *X* is not *Y*, *Y* is *X*; ∴ Some *X* is not *Z*
>> (minor pr. converted *p*).
>
> (Fig. IV) *Fresison*, *Z* is not *Y*, Some *Y* is *X*, ∴ Some *X* is not *Z*
>> (minor pr. converted *s*).

Except for a missing mood just before *Camenes* there is an exact parallelism in the above scheme.

§ 798. In the four Indirect Moods, including *Bocardo*, the condition must be regarded as fulfilled, carrying with it a positive rule. *Bocardo* concludes, however, directly about not-*P*.

Condition fulfilled :—

Universally—(Fig. IV) *Bramantip*, *Z* is *Y*, *Y* is *X*; ∴ (*Z* is *X*)
Some *X* is *Z*
(conclusion conv. *p*).

Particularly
$$\begin{cases}
\text{(Fig. IV) \textit{Dimaris}, Some } Z \text{ is } Y, Y \text{ is } X; \therefore \text{(Some} \\
\quad Z \text{ is } X) \text{ Some } X \text{ is } Z \\
\qquad \text{(conclusion conv. } s\text{).} \\
\text{(Fig. III) \textit{Disamis}, Some } Y \text{ is } Z, Y \text{ is } X; \therefore \text{(Some} \\
\quad Z \text{ is } X) \text{ Some } X \text{ is } Z. \\
\qquad \text{(major pr. conv. } s\text{, and conclusion conv. } s\text{).} \\
\text{(Fig. III) \textit{Bocardo}, Some } Y \text{ is not } Z, Y \text{ is } X; \\
\quad \therefore \text{(Some not-}Z \text{ is } X) \text{ Some } X \text{ is not } Z \\
\text{(obvert and convert major pr., convert and obvert} \\
\qquad \text{conclusion).}
\end{cases}$$

The direct conclusions are the ones in brackets.

§ 799. Once more. If the First Figure be taken as the syllogistic type, then, since the major premiss in this figure must be universal and have a distributed middle term, the possible major premisses are :—

Every *M* is *P*
No *M* is *P*
No *P* is *M*.

And since the minor premiss must be affirmative, it may take one of these four shapes—

Every *S* is *M*
Every *M* is *S*
Some *S*'s are *M*
Some *M*'s are *S*.

Combining, we get twelve direct Moods. Five others reduce to this type by transposition of premisses, viz. *Camestres*, *Disamis*, *Bramantip*, *Dimaris* and *Camenes*. There remain *Baroco* and *Bocardo*. The former, a direct Mood, gives a conclusion in *Ferio* through not-*M*—

Every *P* is *M*   = No *P* is not-*M* = No not-*M* is *P*
Some *S*'s are not *M*   = Some *S*'s are not-*M*.
∴ Some *S*'s are not *P*—

and the latter, an indirect Mood, concludes in *Darii* about not-*P* —
Some *M*'s are not *P* = Some *M*'s are not-*P* = Some not-*P*'s
are *M*

Every *M* is *S*

∴ Some not-*P*'s are *S* = Some *S*'s are not-*P* = Some *S*'s are
not *P*.

§ 800. It should be noticed that some judgement about non-*P*
is involved in the conclusion of every Mood, if it is A, E or O.
' Every *S* is *P* ' implies that No non-*P*'s are *S* ; ' No *S* is *P* ' that
Some non-*P*'s are *S* ; and the same judgement is involved in
' Some *S*'s are not *P* '. Thus from an argument in *Ferio*—

No arguments based on an undistributed middle term are
legitimate ;

Some arguments often advanced are so based ;

Then, some arguments often advanced are not legitimate—

we get the judgement, ' Some illegitimate arguments are often
advanced.'

§ 801. Some judgement about non-*S* is involved in every A
or E conclusion, viz. a particular negative judgement in A, and
a particular affirmative judgement in E. Thus in *Barbara*—
Every *S* is *P*. Everything that is knowledge is known to me.
= No *S* is non-*P*. Nothing that is knowledge is unknown to me.
= No non-*P* is *S*. Nothing unknown to me is knowledge.
= Every non-*P* is non-*S*. All I do not know is not knowledge.
= Some non-*S*'s are non-*P*. Some things which are not know-
ledge are unknown to me.

Celarent, Cesare, Camestres and *Camenes*, on the other hand,
enable us to infer that Some non-*S*'s are *P*.

Nothing whatever can be inferred universally about non-*S*;
nor yet about non-*P*, except the absence of *S*.

A universal negative conclusion about non-*S* is never involved
in any judgement about *S*. We cannot infer that none but the
brave (no non-brave) deserve the fair from any pair of premisses
which have ' the brave ' for minor term.

§ 802. Inasmuch as every negative proposition can be made
an affirmative one by attaching the negation to the predicate, it
may be inquired how far the *abolition of quality* would simplify
syllogism.

Figure I.

(*Celarent*)	becomes	(*Barbara*)
No *M* is *P*		Every *M* is not-*P*
Every *S* is *M*		Every *S* is *M*
No *S* is *P*		Every *S* is not-*P*.

(*Ferio*)	becomes	(*Darii*)
No *M* is *P*		Every *M* is not-*P*
Some *S*'s are *M*		Some *S*'s are *M*
Some *S*'s are not *P*		Some *S*'s are not-*P*.

Figure II.

(*Cesare*)	becomes	(*Barbara*)
No *P* is *M*		Every *M* is not-*P*
Every *S* is *M*		Every *S* is *M*
No *S* is *P*		Every *S* is not-*P*.

(*Camestres*)   becomes by transp.   (*Barbara*)

Every *P* is *M*		Every *M* is not-*S*
No *S* is *M*		Every *P* is *M*
No *S* is *P*		Every *P* is not-*S*
		(= No *S* is *P*).

(*Festino*)	becomes	(*Darii*)
No *P* is *M*		Every *M* is not-*P*
Some *S*'s are *M*		Some *S*'s are *M*
Some *S*'s are not *P*		Some *S*'s are not-*P*.

(*Baroco*)	becomes	(*Darii*)
Every *P* is *M*		Every not-*M* is not-*P*
Some *S*'s are not *M*		Some *S*'s are not-*M*
Some *S*'s are not *P*		Some *S*'s are not-*P*.

Figure III.

(*Felapton*)	becomes	(*Darii*)
No *M* is *P*		Every *M* is not-*P*
Every *M* is *S*		Some *S*'s are *M*
Some *S*'s are not *P*		Some *S*'s are not-*P*.

(*Bocardo*)   becomes by transp.   (*Darii*)

Some *M*'s are not *P*		Every *M* is *S*
Every M is S		Some not-*P*'s are *M*
Some *S*'s are not *P*		Some not-*P*'s are *S*
		(= Some *S*'s are not-*P*).

(*Ferison*)	becomes	(*Darii*)
No *M* is *P*		Every *M* is not-*P*
Some *M*'s are *S*		Some *S*'s are *M*
Some *S*'s are not *P*		Some *S*'s are not-*P*.

Figure IV.

(*Camenes*)	becomes	(*Barbara*)
Every *P* is *M*		Every not-*M* is not-*P*
No *M* is *S*		Every *S* is not-*M*
No *S* is *P*		Every *S* is not-*P*.

aliter per transpositionem

Every *P* is *M*	Every *M* is not-*S*
No *M* is *S*	Every *P* is *M*
No *S* is *P*	Every *P* is not-*S*
	(= Every *S* is not-*P*).

(*Fesapo*)	becomes	(*Darii*)
No *P* is *M*		Every *M* is not-*P*
Every *M* is *S*		Some *S*'s are *M*
Some *S*'s are not *P*		Some *S*'s are not-*P*.

(*Fresison*)	becomes	(*Darii*)
No *P* is *M*		Every *M* is not-*P*
Some *M*'s are *S*		Some *S*'s are *M*
Some *S*'s are not *P*		Some *S*'s are not-*P*.

§ 803. We see then that *Celarent, Cesare, Camestres* and *Camenes* may be exhibited as *Barbara*, and the other eight negative moods as *Darii*. Such abolition of propositional quality, however, is not in every case obvious and natural. For the mind may perhaps pass instantaneously from 'No shallow natures are patient' to 'All shallow natures are impatient'. But there is not an immediately obvious equivalence between this syllogism (*Camenes*)—

> Every disciplined nature is patient,
> No patient nature is complaining,
> ∴ No complaining nature is disciplined,
>   and this (*Barbara*)—
> Every impatient nature is undisciplined,
> Every complaining nature is impatient,
> ∴ Every complaining nature is undisciplined.

§ 804. Moreover, as we have more than once noticed (§ 158), negative conception only in a certain 'universe of discourse' be-

comes privative and implies a positive idea. If a line is not straight it must be curved or crooked, and if we say that an action is not kind it is probably unkind (though even this does not follow, for most actions are neither, yet that would usually be our meaning). But we cannot say that because ink-pots are not successful novelists, they are therefore unsuccessful novelists. Arguments are in practice seldom framed except as understanding a positive idea by a negated term. But logically it is different. And therefore, although negative moods may all be exhibited easily in an affirmative form, the idea of negation cannot be abolished, not-X meaning a thing which is not X.

§ 805. It has already been noticed that, when the mark of negation is attached to the predicate, every negative mood in whatever figure appears as *Barbara* or *Darii*. But *Fesapo* may also be exhibited as *Darapti* (Every M is not-P, Every M is S, ∴ Some S's are not-P), and *Fresison* as *Datisi*. *Felapton* glides easily into *Darapti* in the same figure (Every M is not-P, Every M is S, ∴ Some S's are not-P), *Ferison* into *Datisi*, *Bocardo* into *Disamis*. In Figure II, *Festino* can be exhibited as *Datisi* in the Third Figure or as *Dimaris* in the Fourth; *Baroco* also as *Datisi* or as *Dimaris*. *Ferio* in Figure I can be shown as *Datisi* or as *Dimaris*. But the four moods with universal conclusion, *Celarent*, *Cesare*, *Camestres* and *Camenes*, cannot be exhibited except in *Barbara*.

§ 806. The following simplification of Syllogism is here suggested, by which also quality is got rid of. Negative propositions have a distributed predicate. If, now, all distributed terms are indicated by a capital letter, and undistributed terms by a small one, mere juxtaposition of subject and predicate will suffice for any kind of proposition. A will be Sp. I will be sp. E will be shown as SP and O as sP. The relation of the middle term to the extremes will accordingly be fourfold in the minor (Sm, sm, SM, sM), and fourfold in the major (Mp, mp, MP, mP).

The moods which, on the basis of Figure I, conclude about S directly will then appear thus :—

Figure I.

(*Barbara*)	(*Darii*)	(*Celarent*)	(*Ferio*)
Mp	Mp	MP	MP
Sm	sm	Sm	sm
Sp	sp	SP	$sP.$

Figure II.

(*Cesare*)	(*Festino*)	(*Baroco*)
PM	PM	Pm
Sm	sm	sM
SP	sP	$sP.$

Figure III.

(*Darapti*)	(*Datisi*)	(*Felapton*)	(*Ferison*)
Mp	Mp	MP	MP
Ms	ms	Ms	ms
sp	sp	sP	$sP.$

Figure IV.

(*Fesapo*)	(*Fresison*)
PM	PM
Ms	ms
sP	$sP.$

§ 807. It will be observed that the conclusion is obtained at once by merely dropping out the middle term.[1] The subsumption is also obvious, or easily distinguished, except in *Baroco*, where the middle term is undistributed in the major premiss—Pm. We have seen above that if we reduce to Figure I this is here not the true middle term, and that an inference can only be drawn by an obversive process—Not-MP, s not-m, sP. Not-M (not-m) might be replaced by M' (m'). *Baroco* will then be

$$M'P$$
$$sm'$$
$$sP.$$

The predicate of *Bocardo* must be treated in the same way to yield an inference. But, this being an indirect Mood, the premisses have also to be transposed.

$$mP \diagdown \diagup Ms$$
$$Ms \diagup \diagdown p'm$$
$$sP \qquad p's \ = \ sp' \ = \ sP.$$

§ 808. As regards those other moods, besides *Bocardo*, in which, on the basis of Figure I, we conclude about S indirectly —the premisses being transposed and the conclusion converted —we shall find that, except the intractable and incorrigible

[1] This is something like the rule set forth by Ploucquet (1763), who based his Calculus on it,—'Deleatur in praemissis medius; id quod restat indicat conclusionem' (criticized by Hamilton, *Lectures on Logic*, ii. 316).

Bramantip, the conclusion of them also is found by merely dropping out the middle term. But the subsumption appears as reversed (owing to the transposition of the premisses); and it is only because the indirect conclusion shown by *Bramantip* (Some S's are P) has been converted 'by limitation' from the direct conclusion (Every P is S) that it differs from *Camestres, Disamis, Dimaris* and *Camenes*, in which the conclusion has been converted *simpliciter*. In the case of *Bocardo*, as we have just seen, the distributed term P of a negative proposition is changed to an undistributed term $p'a$ of an affirmative proposition.

<div align="center">

Figure II.

(*Camestres*)

Pm

SM

$PS = SP.$

</div>

(But *Camestres* may also be exhibited with a direct conclusion like *Baroco*

<div align="center">

$M'P$

Sm'

$SP.$)

Figure III.

</div>

(*Disamis*)	(*Bocardo*)
mp	$mP = mp' = p'm$
Ms	Ms
$ps = sp$	$p's = sp' = sP.$

<div align="center">

Figure IV.

</div>

(*Bramantip*)	(*Dimaris*)	(*Camenes*)
Pm	pm	Pm
Ms	Ms	MS
$Ps = sp$	$ps = sp$	$PS = SP.$

De Morgan (p. 333) quotes Ploucquet's notation—

$$\left.\begin{array}{l} Pm \\ s > M \end{array}\right\} s > m\,P;$$

i.e. quoddam s non est P (*Baroco*)—where $>$ is the sign of negation. Some of the S's are not any M's, are not those M's which make up all the P's, are not therefore any P's. 'This demand for identical substitutes requires both kinds of quantity for every predicate.'

§ 809. It is difficult to improve on Pope John's time-honoured mnemonics for reduction to the First Figure. They fail, however, to appeal to the ear, and the significant consonants are not at once distinguishable from those—e. g. in *Barbara, Celarent, Bramantip, Fresison*—which are without meaning. The consonants used merely for euphony might be one only, say *l*, which might always be placed after the true major premiss or rule, so that if it occurred after the second syllable of any mood we should notice at once that the Mood is indirect and the premisses must be transposed. Further, that the ear may assist the memory, let the true major premiss always be long and the other premiss short. Then *Bālăă* would supersede *Barbara, Cēlăĕ Celarent, Băālĭp Bramantip*, and so forth.

§ 810. *Camestres* and *Camenes*, however, as shown above, should not indicate transposed premisses and an indirect conclusion, nor should *Baroco* and *Bocardo* be reduced by the *ad absurdum* method. In these four moods we have to change affirmative into negative propositions and vice versa, by obversion.

Then *Camestres* (Every *P* is *M*, No *S* is *M*, ∴ No *S* is *P*) becomes No not-*M* is *P*, Every *S* is not-*M*, ∴ No *S* is *P* (= *Celarent*). *Baroco* in the same way takes the form, No not-*M* is *P*, Some *S* is not-*M*, ∴ Some *S* is not *P* (= *Ferio*).

Bocardo must have its premisses transposed. But it need not be reduced *ad impossibile*. Some *M* is not *P*, Every *M* is *S*, ∴ Some *S* is not *P*, becomes, Every *M* is *S*, Some not-*P* is *M*, ∴ Some not-*P* is *S* = Some *S* is not-*P* = Some *S* is not *P* (= *Darii*).

Camenes (Every *P* is *M*, No *M* is *S*, ∴ No *S* is *P*) becomes, No not-*M* is *P*, Every *S* is not-*M*, No *S* is *P* (= *Celarent*).

§ 811. Now change in the quality of a proposition (obversion) may be denoted by the letter *b* put after the syllable. This followed by conversion (conversion by negation) may be denoted by *n*. Conversion followed by obversion may have *m* for symbol.

The letter *s* will still signify simple conversion and *p* conversion *per accidens*. The initial letters indicate the mood in Figure I, to which any mood is to be reduced. It seems better to juxtapose moods according to the quantity of the minor premiss than according to the quality of the major. Then,

1. *Hosce modos dat prima figura*—

<div align="center">

Bālăă, Dālĭī ;   Cēlăĕ, Fēlĭŏ,
(*Barbara*) (*Darii*)   (*Celarent*) (*Ferio*)

</div>

2. *Quattuor hos appone secundae*—

  Cēlsăĕ, Fēlsĭŏ;   Cālnĕbĕ, Dālnŏbŏ.
  (*Cesare*) (*Festino*)   (*Camestres*) (*Baroco*)

3. *Exhibet has sex tertia formas*—

  Dālăpi, Dālĭsi;   Fēlăpŏ, Fēlĭsŏ
  (*Darapti*) (*Datisi*)   (*Felapton*) (*Ferison*)

   deinde Dĭsālĭs, et adde Dŏnālōm ·
     (*Disamis*)   (*Bocardo*)

4. *Quinque vices habet ultimus ordo*—

  Has tres : Cālnĕmĕ, Fēlsăpŏ, Fēlsĭsŏ
     (*Camenes*) (*Fesapo*) (*Fresison*)

   Quarta Băālĭp ; quinta Dĭālĭs
    (*Bramantip*)   (*Dimaris*)

§ 812. I am unable to agree with Professor Veitch when he says : 'The usual logical tests of the major and minor terms in a reasoning are obviously of a wholly superficial nature. The main one is really the relative local position of the terms.'[1] But the difference between subject and predicate in the conclusion is much more than a question of local position. No doubt Hamilton's Unfigured Syllogism, based on an equational theory of judgement, destroys the distinction, and in the Syllogism of Comprehension Hamilton's claim for the minor term and premiss to be the major can be admitted. But, from whichever end we start, the difference between major and minor is not superficial or accidental, but essential. Veitch himself speaks of 'the essential mental relations of Containing and Contained'.[2] It is true that in the Second and Third Figures S and P have not M, the 'middle' term, *between* them, that some moods require a transposed statement, and that one, *Darapti*, admits of either premiss being the rule. But that is far removed from the assertion that 'there is formally or logically no major or minor term or premiss in the second or third figures'.[3] Veitch says :—

§ 813. 'In the Second Figure the middle term is the predicate of both premisses—

$$C \text{ is } M,$$
$$\Gamma \text{ is } M.$$

[1] *Institutes of Logic*, p. 383.   [2] Ibid. p. 406.
       [3] Ibid. p. 383.

The form thus merely tells us that each extreme is contained under the middle, but it says nothing of the relation of the one extreme to the other. There is no subordination of greatest or least.'[1]

He appears to overlook the circumstance that in this figure one premiss is negative and the other affirmative, and that in none of the moods can there be any doubt which is logically the major premiss or rule, and which the minor premiss or subsumption. But the Professor slips from Figured to Unfigured Syllogism and back again. He expands C is M, Γ is M, thus :—

(Some) C is (some) M
(Some) Γ is (all) M
∴ (Some) C is (some) Γ
or, (Some) Γ is (some) C—

and remarks : ' Now it is obvious that we are very near the abolition of Figure altogether. We may now reason that, as C is M and Γ is M, C is Γ or Γ is C.'[2] Thus to mix up two questions is intolerable. To be sure, Quantification of the Predicate, if admitted, leads to a great many consequences and obliterates many logical distinctions. But the point we are immediately concerned with relates to ordinary syllogistic reasoning, and to the allegation that the distinction there between major and minor is merely superficial and local.

§ 814. Of course the mere order in which the premisses are stated is quite immaterial, and implies at most a slight shifting of the point of view, or it may be the succession in which the facts become known and the judgements present themselves. From Aristotle to Boethius logicians preferred to state the minor premiss, or fact, first, and the major premiss, or principle, second[3], thus giving the 'middle' term a local as well as a rational mediation. S is M, M is always, or never, P.

§ 815. It has been said that there are many good maxims in

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[1] Op. cit. p. 409.   [2] Ibid. pp. 409, 410.
[3] This order seems to reconcile logic and grammar best. For we must regard the element in the grammatical sentence on which emphasis is placed as the true logical predicate. But if the major premiss is stated before the minor, the stress of the voice falls on the subject in both. ' The *eldest* must work. *John* is the eldest. Then *John* must work.' John here is the real *quaesitum*. In the reverse order, we are asking what John is to do. ' John is the *eldest*. The eldest must *work*. Then John must *work*.'

the world. The difficulty is to apply them. Here the major pre-
miss presents itself earlier than the minor. On the other hand,
every unrelated and unexplained experience is waiting for its
major premiss.

§ 816. The position of the Conclusion has a different signifi-
cance. When we argue synthetically we put the conclusion
last. In an analytic argument the conclusion—here more
properly called the *propositum, quaesitum* or *thesis*—is followed
by the reasoning on which it rests.[1] Of the latter kind were
most of the formal disputations of the schools. Should the
thesis be propounded as a question, it may be repeated as con-
clusion. 'Is *S P*?' 'Yes, for *S* is *M* and *M* is always *P*. So
that *S* is *P*.'

§ 817. According to Dr. Max Müller the logicians of India
employ a five-membered syllogism :—

(1) *Assertion.* This mountain is on fire.

(2) *Reason.* Because it smokes.

(3) *General proposition.* Now no smoke is without fire.

(4) *Assumption.* And we agreed that this mountain smokes.

(5) *Conclusion.* Therefore it is on fire.[2]

When a *propositum* is followed by its premisses, the minor is
usually stated first :—

This is a volcano.

Because it smokes.

And there is no smoke without fire.

But in the example of Indian logic just given the minor is
repeated, or resumed, after the major premiss.

§ 818. When the major premiss precedes the minor, the mind
is looking for subjects of propositions ; when the minor precedes,
it is looking for predicates. *S* is *P*, for *M* is *P*, and *S* is *M*.
Again, *S* is *P*, for *S* is *M*, and *M* is *P*. 'It is he is the coward,
for *those who run away from danger* are cowards, and *he* ran
away.' Or again, 'He is a coward, for he *ran away*, and those
who run away are *cowards*.' 'This is the volcano. For where
there is *smoke* there is fire. And *this mountain* smokes.' Or,

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[1] 'It is not the case that a conclusion ceases to be an inference the
moment that it becomes familiar, i. e. that it ceases to be a discovery.
On the contrary, discovery without proof is conjecture. . . . Novelty or
discovery is an accident of inference' (Bosanquet, *Logic*, ii. 8, 9).

[2] Quoted in Appendix to Thomson's *Laws of Thought.*

'This is a volcano (This mountain is on fire). For it *smokes*. And where there is smoke there is sure to be *fire*.'

If the conclusion is stated last, there will similarly be a stress on subject or predicate, according as minor or major premiss precedes. 'Where there is smoke there is fire. This mountain smokes. Therefore *this mountain* is on fire.' That is, the rule applies to the present case. But, 'This mountain smokes. Where there is smoke there is fire. It follows that this mountain is *on fire*.' That is, we have found a rule to bring this smoking mountain under. This at least is the most natural point of view. A deductive argument begins with the general principle. An inductive inquiry begins with the observed fact. Deductive intellects are always on the alert to conclude something—like the Scotsman who after reading *Paradise Lost* asked, What does it prove?

§ 819. The position of the conclusion matters less practically than the order of the premisses, for there can be never any doubt which is the conclusion. It is indeed often enounced *between* the premisses—*M* is *P*, therefore *S* is *P*, since *S* is *M*. The following, in a very condensed form, is an example of major, conclusion, minor—'Fire! Fetch a ladder! My child is upstairs'. But this kind of enunciation, or one with minor premiss first and major last, is of course very common. 'Sick people lose their appetite. So he must be ailing, for he eats nothing.' 'He is a liar, and accordingly needs to cultivate his memory; for liars need good memories.'

§ 820. Hamilton's assault on the common order—major premiss, minor premiss, conclusion—as 'unnatural and contorted by hitches and abrupt transitions' rests on the assumption that the conclusion is always *quaesitum*. Why should it never be *inventum*? Reasoning is not all argumentative and eristic. It more frequently leads us to unexpected applications. 'In the synthetic or common order,' he writes, 'all is pleonastic and anticipative. What is first in reality and interest, and in and for the sake of which the whole reasoning exists, comes last; till the conclusion is given we know not (at least we ought not to know) how the question is answered.'[1] 'Question', however, begs the question. Not that the point is of any importance. We may either regard the enunciation of syllogism as a reasoned

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[1] *Lectures on Logic*, ii. 400.

One analysed into a Many, or as a Many synthesized into a reasoned One. 'How do you prove it?' in the former case. 'What follows?' in the latter. A conclusion stands to its premisses in syllogism in the relation of predicate to subject. 'All *S*-being-*M* and *M*-being-*P* is *S*-being-*P*.' But judgements have the same logical enunciation whether it were subject or predicate that the mind looked for. It may be asked, Who killed Cock Robin? Or it may be asked, What did the Sparrow do? In either case the answer is, 'I killed Cock Robin.' Only the emphasis is different.

§ 821. In setting forth his doctrine of the Intensive or Comprehensive Syllogism, Sir William Hamilton lays it down that, as the counterpart of the Extensive Syllogism, it must necessarily suffer a 'transposition of the order or subordination of the two premisses', the reciprocal relation of the terms being reversed. That is to say, the term which is usually called the major, as having the larger extension, will now be the minor, as having the less intension. The qualitatively affirmative premiss, usually called the minor, will now be the major premiss or 'sumption', and the quantitatively definite premiss, usually called the major, will now be the minor, or 'subsumption'. In the Extensive Syllogism the conclusion must agree in quality with the sumption, and not exceed in quantity the subsumption. In the Intensive Syllogism it must agree in quality with the subsumption and not exceed in quantity the sumption.[1]

§ 822. This, however, is only a roundabout way of saying (what Hamilton himself teaches) that the two kinds of Syllogism, in Breadth and Depth, are one and the same thing, regarded in counter-relations and from opposite standpoints.

Extensive Syllogism.	*Intensive Syllogism.*
Every *Y* is (or, is not) contained in (class) *Z*.	*Z*-ness is (or, is not) comprised among the attributes of all things that are *Y*.
X is contained in (class) *Y*.	*Y*-ness is comprised among the attributes of *X*.
Therefore *X* is (or, is not) contained in (class) *Z*.	Therefore *Z*-ness is (or, is not) comprised among the attributes of *X*.

[1] Op. cit. i. 315 seq.

In either case what matters is the quality of the relation between Y and Z (the quantity being necessarily universal), and the quantity of the judgement about X (the quality being necessarily affirmative). Hamilton, for the intensive syllogism, reverses the order of the premisses, putting the 'extensive' major, which may be affirmative or negative, second :—

Prudence comprehends virtue ;

But virtue does not comprehend blameworthy ;

Therefore prudence does not comprehend blameworthy.

§ 823. It must be observed in passing that the expressions Sumption and Subsumption, in their reversed application, are most unnatural. The 'sumption' of Hamilton's intensive syllogism may be a particular proposition, the 'subsumption' a denial of predication, unable therefore to be 'brought under' a rule. Hamilton says :—' In the extensive syllogism the subsumption is, and can only be, an affirmative declaration of the application of the sumption as a universal rule. In the intensive syllogism, the subsumption is either an affirmation or a negation of the application of the sumption as a positive law.'[1]   It is not easy to see any meaning in this. If we say (intensively),

Dullness is an attribute of some books (Hamiltonian sumption) ;
Intolerableness is an attribute of dull things (H. subsumption) ;
Therefore intolerableness is an attribute of some books (i. e.
   Some books are intolerable),

a fact is affirmed in the 'sumption' but not a law or rule. Hamilton had just said : 'The condition common to both syllogisms is that the sumption should express a rule. But in the extensive syllogism this law is an universal rule ... whereas in the intensive syllogism this law is expressed as a position, as a fact ; but, as it is not necessarily universal, it admits of limitations or exceptions.'[2]   It would be better to admit that the expressions 'sumption' and 'subsumption' are only applicable to the ordinary order. Hamilton complains elsewhere[3] that 'the whole nomenclature of the syllogistic parts has reference to the one-sided views of the logicians in regard to the process of reasoning '. Here is a piece of reasoning :—' Four men attacked me. Those who attack me get the worst of it. Therefore these four men got the worst of it.' How can 'Four men attacked me ' be called a 'rule ' or 'positive law '?

[1] Op. cit. p. 317.   [2] Ibid. p. 316.   [3] Ibid. p. 282.

§ 824. Professor Veitch, however, has misgivings about the theory of reasoning in Comprehension. He says—

'The defects of the theory come out most markedly in relation to negative conclusions. Here, in fact, it seems to me to break down, when left wholly to itself. The law for affirmatives as given by Hamilton . . . is quite valid, and is strictly a reasoning in Comprehension. But take the other half of the rule—that for negatives—" The predicate of the predicate is, with the predicate, denied of the subject ". Thus :—

> Man does not include in it mineral ;
> Mineral includes in it weight ;
> Therefore man does not include in it weight.

This is wholly invalid as a reasoning in Comprehension [or as reasoning at all]. All that is denied is *some* weight,—the weight that is in mineral. But this is in Extension, and the conclusion is so cloaked as to be deceptive.'[1]

§ 825. So far, Veitch's criticism is a mere blunder. He has made the (intensive) major premiss the negative one, instead of the minor. Hamilton's syllogism is :—

> X comprehends Y,
> Y does not comprehend (i. e. excludes) Z,
> Therefore X does not comprehend Z.

But Veitch states it thus :—

> X does not comprehend Y,
> Y comprehends Z,
> Therefore X does not comprehend Z.

Which is, of course, as he says, a fallacious inference.[2]

§ 826. On the next page, however, he gets upon the trail of Hamilton's real misconception, viz. his confusion between the attributes of an object and the content of a notion. But, unfortunately, he objects to the validity of Hamilton's illustration, when the true objection is to the choice of it. Taking the intensive syllogism,

> Prudence comprehends virtue ;
> But virtue does not comprehend blameworthy ;
> Therefore prudence does not comprehend blameworthy,

[1] *Institutes of Logic*, pp. 433, 434.
[2] Though we may contrive syllogisms in which the invalid conclusion comes out true, e. g.—

Grenadier does not comprehend dwarf;
Dwarf comprehends very small stature ;
Then grenadier does not comprehend very small stature.

For nothing can 'comprehend' small stature except dwarf. And yet there might be fairy grenadiers.

Veitch remarks :—

' It seems to me that there is no valid conclusion in the illus-
tration given.   *Virtue is a mark of prudence,* i. e. *the attribute
virtue is an attribute of prudence ; the attribute blameworthy is not
an attribute of virtue* ; it does not follow from this that *the attribute
blameworthy is not an attribute of prudence.*   We might just as
well argue that because *animal* life is an attribute of man, and
weight is not an attribute of *animal life,* that *weight* is not an
attribute of man.   What is not simply a mark of the mark is not
necessarily not a mark of the thing itself. . . . I cannot infer that
blameworthy is not *imprudence* ; but only not in *that part of
prudence* which is convertible with *virtue.*   If I say :—

> Man comprehends animal life ;
> No animal life has weight,

I cannot, therefore, say that no man has *weight,* but only that
weight is not in that part of man which is convertible with *animal
life.*' [1]

Hamilton, however, would have insisted, with some reason,
that virtue is part of the *idea* of prudence.   And the expression,
' Blameworthy is not an attribute of virtue,' should be, ' is
excluded by the attributes of virtue.'

§ 827. It would be tedious to examine the conditions which
Veitch lays down before reasoning in Comprehension with a
negative conclusion can be valid.   The confusion really lies in
the acceptance of Hamilton's doctrine of conceptual inclusion.
The import of ' *X* is *Y*' is that *Y*-ness, the being *Y,* is comprised
among the *attributes possessed by X,* not that it is included in the
notion X.

§ 828. These ambiguities would have been detected at once
if abstractions like ' Man ', ' prudence,' and ' virtue ' had been
avoided.   But Hamilton's doctrine of the import of propositions
is radically unsound and confused.

§ 829. The difficulty which is sometimes raised, e. g. by De
Morgan, that ' in the affirmative any portion of the intension of
the predicate may be affirmed of the subject ; in the negative it is
not true that any portion of the intension of the predicate may be
denied of the subject ', is merely the general doctrine of negation,
viz. that an entire concept cannot be negated, so that ' No planet
has a circular motion ' denies ' circular ' but not ' motion '.   The
negated element of the concept is the only part of it which is
denied in the conclusion.

[1] Op. cit. pp. 435, 436.

§ 830. The same addiction to analytic judgements misleads McCosh, who says :—

'The regulating principle of the Syllogism in Comprehension will be, " A part of a part of an attribute will be part of the whole attribute."

' Free will is an attribute of responsibility. Responsibility is an attribute of man ; . . . Free will is an attribute of man . . . We mean, on the principle that the abstract implies the concrete, that whatever things contain a part must also contain a part of that part, e. g. that men, having the attribute of responsibility, have the attribute of free will involved in that responsibility. We seem thus to be thrown back on extension as the uppermost thought in reasoning.'[1]

It is by no means clear what McCosh means by 'part of' and 'involved in' an attribute. He seems to waver between 'implied in the notion' and 'necessarily accompanying the attribute'—an ambiguity which is fostered, as in Hamilton's illustration, by the employment of a middle term like 'responsibility', which no doubt contains in itself the idea of free will. If a man remarks, 'I have been often threatened, but threatened men live long; therefore I hope to see old age,' ought we to say that *Having often been threatened* is 'part of' the attribute *self*, and *long life* is 'part of' the attribute *often threatened*? McCosh, however, is himself far from satisfied, and sees somewhat confusedly that the middle term in one premiss, viz. where it stands as subject, must be regarded not as attribute but as possessor or possessors of an attribute. He says :—

§ 831. 'In the greater number of propositions the uppermost thought is in comprehension. But it is different when we consider judgements so connected as to entitle us to draw a conclusion. The uppermost spontaneous thought seems now to be in extension. When we argue that " The Red Indian, having the power of speech, is a human being", we refer, in thought, the Red Indian to a class composed of those who have the power of speech.'[2]

Not necessarily in a syllogism any more than in a proposition. Certainly, 'possessor of an attribute' as the predicate of the one premiss can be thought without any direct reference to others of the same sort ; whereas, as the subject of the other premiss,

[1] *Laws of Discursive Thought*, p. 139.
[2] Ibid. p. 138.

it is necessarily understood in potential universality. S is possessor of attribute M-ness.   A (= any) possessor of attribute M-ness is possessor of attribute P-ness.   But the essential point is that M as predicate is adjectival, as subject it is substantival. The 'uppermost thought' may be the qualification of the subject rather than the subject itself as object.   But when Hamilton speaks of Reasoning in Comprehension he means something more than uppermost thoughts.   He means the 'inclusion' of concepts in concepts.   He does not mean the attribution of attributes to attributes—a possible but very limited kind of reasoning—e. g. 'Punctuality is the politeness of princes.   The virtue I prize most is punctuality'—where there is, in fact, identi- fication rather than attribution, or rather the attribution of identity with the quality, not the quality itself.   What is attributed to punctuality is not politeness (which would require 'is polite'), but intensional equivalence with royal politeness.   In 'Stateliness is old-fashioned' an attribute is attributed to an attribute. Hamilton, however, declares that reasoning is a mode of ascer- taining that one notion is part of another.   But in synthetic judgements what we affirm is not the inclusion of one notion in another, but the conjunction or coexistence of two attri- butes in the same subject.

CHAPTER XXV

UNFIGURED SYLLOGISM

§ 832. A LESS space will suffice for considering the bearing of Hamilton's theory of Extensive Judgement with Quantified Predicate on Inference.

Propositions becoming equations, and therefore simply convertible, Figure is seen to be unessential. Syllogisms are distinguished from one another, not by the position of the middle term, but only by the quality and quantity of their premisses. In practice the three Figures (Hamilton disallows the Fourth) may have special uses and functions—Figure II, for instance, is suited to deductive reasoning in extension, Figure III to inductive reasoning in intension. But Mood alone is the essential thing.

§ 833. The Unfigured Syllogism does not proceed from the more to the less, or from the less to the more, general, but from equal to equal. It is therefore neither deductive nor inductive, but *traductive.*

§ 834. Hamilton's single Canon of Figured Syllogism is this:—

'What worse relation of subject and predicate subsists between either of two terms and a common third term, with which one at least is positively related, that relation subsists between the two terms themselves.'[1]

§ 835. This serves for reasoning in Comprehension as well as in Extension. But the following canon of Unfigured Syllogism adopts the objectionable phrase 'agreement of notions':—

'In as far as two notions (notions proper or individuals) either both agree, or, one agreeing, the other does not, with a common third notion: in so far these notions do or do not agree with each other.'[2]

§ 836. Upon the abrogation of all the special laws of Syllogism Devey well observes :—

'The general rules, and even the special rules of the figures,

[1] *Lectures on Logic,* ii. 350.   [2] Ibid.

are in no wise distinct from the canon, but only act as so many
cautions, which it is advisable for the reasoner to have before him,
in order that he may not violate any of its principles. They
might therefore be omitted from the old logic with as much pro-
priety as from the system sought to be established, and with
more security against error, since its code of valid syllogisms are
much fewer than those arising out of the quantification of the
predicate, and consequently afford less ground for the violation
of the canon. But in reality they can be spared from neither
system, as it is obviously necessary, to secure the understanding
from error, that every mode by which a deviation can occur
from the principles of right reason should be drawn out distinctly
before it.'[1]

§ 837. At the same time we need not hesitate to admit that the
substitutive inference of an equational Logic is in one sense a
simplification—not as philosophy aims at simplicity, but as the
inorganic is 'simple'. Subjects and predicates are, as it were,
no longer living individualities, but can be transposed and
exchanged like pounds of cheese or sugar. Every term as
quantified is equal to every other term, and it is of no consequence
which comes first or last. But we have already seen (1) that while
every proposition *involves* an equation, or rather an identification,
of extensions, its import is much wider, and therefore to regard
terms merely in their collective aspect is to confine oneself to a
subordinate and unimportant department of reasoned truth.
(2) That the only equations thus obtainable from the ordinary
forms of judgement

$$\text{All} \quad = \text{some,}$$
$$\text{Some} = \text{all,}$$
$$\text{Some} = \text{some,}$$

are three which are obtainable from the propositions *A* and *I*, the
equation All = all representing no logical proposition except
one in which subject and predicate are both singulars or totalities.
No doubt there is an existing class of propositions—'Edward
VII is our present King—our present King is the late Queen's
eldest son—therefore', &c.—but they are identifications simply,
and do not follow from any distributive judgement. If
'All = all' is to be admitted, why not 'All = twenty', or any
algebraic equivalence? (3) Negative propositions cannot be
represented equationally, as already shown (§ 684 seq.), except by

[1] *Logic*, p. 119.

attaching the negative sign to the predicate; so that 'Some X is not Y' becomes, not 'Some X = no Y' (which is meaningless), but 'Some X = some not-Y', and 'No X is Y' becomes, not 'No X = all Y', nor 'All X = no Y', but 'All X = some not-Y'.

§ 838. But if an Unfigured Syllogism would be, so far, a simplification, the great multiplication of moods has just the opposite result, as Hamilton admits :—

'On the new theory many valid *forms* of judgement and reasoning, in ordinary use, but which the ancient logic continued to ignore, are now openly recognized as legitimate; and many *relations*, which heretofore lay hid, now come forward into the light. On the one hand, therefore, logic certainly becomes more complex. But on the other, this increased complexity proves only to be a higher development. The developed Syllogism is, in effect, recalled from multitude and confusion to order and system.' [1]

§ 839. Hamilton's Propositional Forms are eight in number [2] :—

1. Toto-total—all is all
2. Toto-partial—all is some
3. Parti-total—some is all
4. Parti-partial—some is some
   Affirmative.

5. Parti-partial—some is not some
6. Parti-total—some is not any
7. Toto-partial—any is not some
8. Toto-total—any is not any
   Negative.

These eight forms (doubled by conversion) in each of the three premisses, and counting three Figures only, will give, according to Hamilton's own computation, 3,072 possible moods; but of these only 160 affirmative and 320 negative moods are legitimate. The number 3,072 is obtained thus, $8 \times 8 \times 8 \times 3 \times 2$. Veitch reduces the legitimate moods to 108; and, since many of the moods are really the same, he brings down the number to seven affirmative and fourteen negative forms. This is only two more than the traditional logic recognizes; and, if so, what has become of the 'many valid forms' which Hamilton claims to have recovered from undeserved neglect? If, on the other hand, the entire 108, or 480, are given a recognized place, syllogistic logic ceases to have any use as an art. Devey remarks :—

'To scatter the nineteen legitimate forms of inference over 108 distinct moods, comprising the conceivable as well as the actual

[1] *Lectures on Logic*, ii. 252.   [2] Ibid. p. 292.

forms of reasoning, is only breaking down the fence which enables us to hunt a sophism into a corner . . . Even if the new analytic accomplished its object, of enlarging the field of inference, success would be worse than defeat.'[1]

§ 840. It should be further observed that in each equation or equivalence, 'some' is an undetermined quantity. This indefiniteness vitiates any attempt to syllogize by substitution. For instance *Barbara*—

$$\text{All } M = \text{some } P,$$
$$\text{All } S = \text{some } M,$$
$$\therefore \text{ All } S = \text{some } P.$$

But the 'some P' of the conclusion has a narrower extension than the 'some P' of the major premiss. The same with the other moods of Figure I. In Figure III take *Darapti*—

$$\text{All } \quad M = \text{some } P,$$
$$\text{All } \quad M = \text{some } S,$$
$$\therefore \text{ Some } S = \text{some } P.$$

Here Some S and Some P are the same in premisses and conclusion. But in *Disamis*—

$$\text{Some } M = \text{some } P,$$
$$\text{All } \quad M = \text{some } S,$$
$$\therefore \text{ Some } S = \text{some } P—$$

Some P in the conclusion is the same ; but Some S is only part of the Some S of the minor premiss. In *Datisi* it is Some P which has contracted. *Felapton* (All $M = $ some not-P, All $M = $ some S ; $\therefore$ Some $S = $ some not-P) is like *Darapti*. But in *Bocardo* and *Ferison* the extension of Some S is less in conclusion than in premiss.

§ 841. An equational theory of Syllogism, then, which fails to specify the quantity in each case of 'some', is at best pseudo-mathematical.

§ 842. It will be noticed that while 'All $X = $ some Y' converts to 'Some $Y = $ all X', and 'Some $X = $ some Y' converts to 'Some $Y = $ some X', the negative universal proposition (E), 'All $X = $ some not-Y,' implies that All $Y = $ some not-X. In this way *Cesare* (e. g.) is reduced to *Celarent*:—

(*Cesare*)		(*Celarent*)
All $P = $ some not-M.	$=$	All $M = $ some not-P.
All $S = $ some M.		All $S = $ some M.
$\therefore$ All $S = $ some not-P.		$\therefore$ All $S = $ some not-P.

[1] *Logic*, p. 119.

Baroco assumes the equational form :—

$$\text{All} \quad P = \text{some } M,$$
$$\text{Some } S = \text{some not-}M,$$
$$\therefore \text{ Some } S = \text{some not-}P.$$

But 'All P is M' is the proposition, 'No P is not-M,' which is the same as 'No not-M is P'. The major premiss, 'All $P =$ some M,' therefore, may be expressed thus, 'All not-$M =$ some not-P.' *Baroco* is thus reduced to *Darii*. *Celarent* and *Ferio*, we must remember, when expressed equationally, are *Barbara* and *Darii*.

§ 843. In equational syllogizing there is little fear of illicit process of major or minor term. The errors to guard against are Two negative premisses and Undistributed Middle. Yet the middle term in such syllogizing may seem undistributed (as in *Cesare, Ferio, Baroco*, &c.) when it is not so in reality.

§ 844. The Hamiltonians, with their erroneous equating of the terms of negative propositions, have neglected the foregoing field of inquiry, and built up instead a perversely ingenious and complicated syllogistic scheme, unintelligible, or at least not likely to repay the trouble of unravelling.

§ 845. It is rightly pointed out, however, by De Morgan, Hamilton, and others that if the Middle Term, instead of being distributed once at least, has a total quantification in both premisses greater than its own full extension, inference based on arithmetical computation is possible in endless forms. There must be overlapping (ultra-totality) of the two extensions of the Middle Term. No syllogism can be formally bad in which this condition is satisfied, and in which one premiss at least is affirmative, whatever the relation of the extremes to each other or to the Middle Term. Hamilton's Canon is framed to cover every legitimate form of quantification. To take an example :—

$$\text{Two-thirds of } M \text{ is (some) } P,$$
$$\text{Three-fourths of } M \text{ is (some) } S.$$

Therefore some SM ($\frac{8}{9}$ at most or $\frac{5}{9}$ at least) is P. Hamilton, indeed, seems to assign too much importance to the condition that the quantification of the Middle Term shall be in one premiss *a half* of its entire extension, and in the other premiss *more than half*. He calls these respectively Dimidiate Quantification and

Ultra-dimidiate Quantification.[1] Why should not the one be a quarter and the other more than three-quarters—or any other fractional shares together making up more than unity?

$$\tfrac{3}{4} \ M \text{ is } P,$$
$$S \text{ is } \tfrac{1}{3} \ M.$$

Then all S at most, or $\tfrac{1}{4} \ S$ at least, is P,
and $S = \tfrac{4}{9} \ PM$ at most or $\tfrac{1}{9} \ PM$ at least.

Again—

$$\tfrac{3}{4} \ M \text{ is not } P,$$
$$S \text{ is } \tfrac{1}{3} \ M.$$

Then all S at most, or $\tfrac{1}{4} \ S$ at least, is not P.

It should be observed that '$\tfrac{3}{4} \ M$ is P' expressed algebraically is '$\tfrac{3}{4} \ M =$ some P', but 'S is $\tfrac{1}{3} \ M$' is the equation 'All $S = \tfrac{1}{3} M$'.

That M should be wider in the one premiss than in the other is, of course, not enough. '*Most* of my books are bound in calf. Here are *a few* of my books';—it does not follow that any of them are bound in calf.

§ 846. On the other hand, a probability may be thus established: ' Nearly all his papers were destroyed. The letter was among his papers. It was probably, therefore, destroyed.' But the probability is affected by material considerations. If a man has burnt nearly all his papers, it does not follow that he has probably burnt his will, or his title-deeds, or a letter to his grandfather from Lord Nelson. Probability, as we have seen, is not expectation founded on partial knowledge, but the measurement of rational ground for expectation. Boole elaborates formulae so as to express the event whose logical probability is sought as a function of the events the probabilities of which are given. Knowledge, as De Morgan says, is treated as a magnitude. We cannot, he contends, invent a case of purely objective probability. It is true that if there are twice as many white balls in a bag as black, white balls will have come out (sooner or later) twice as often as black ones, and if you do not know which balls have come out you have twice as much ground to expect that the next one will be white as you have that it will be black. But the natural laws which determine that this or that ball shall come out are, if we knew them, fixed.

§ 847. It should be observed that, whereas the premisses, ' Most M's are P, every S is M,' allow us to conclude nothing

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[1] *Lectures on Logic*, ii. 351–6.

certainly, yet from ' Every M is P, Most S's are M ', we are forced to infer that Most S's are P.

' Most M's are P ', however, entitles us to say that every M severally is probably P. So that, if every S is M, every S is probably P. The old Chiltern saw, implying that the county is so full of robbers that one lurks in almost every thicket, says : ' Beat a bush and it's odds you start a thief.'

A proposition such as ' Many are called but few chosen ' must not be regarded as partitive but as a compound generalization. ' It is always seen that many ', &c., or ' It is the Divine will that many ', &c. The minor premiss will be, ' This is a case of the implied conditions being satisfied.' Again, ' Most children (i. e. at a treat, or when asked) prefer plum-cake to seed. This is a treat, *or* we are going to ask the children. Therefore, most of them will choose plum-cake.'

§ 848. The endeavour to represent logical processes by algebraic forms received a great stimulus from Boole's *Mathematical Analysis of Logic*, published in 1847. It was followed by Jevons's *Logic of Quality* in 1864. Jevons, who speaks of the ' newly discovered quantification of the predicate ', while claiming to improve on Boole's system, which is rather numerical than purely logical, describes it as 'perhaps one of the most marvellous and admirable pieces of reasoning ever put together '. It is to De Morgan, however, that he ascribes the 'high honour' of being ' probably the first logician who pointed out that syllogistic arguments may exist in which the number of objects forming the several terms of the syllogism may be exactly defined, and that inference is often possible with such premisses when it would not otherwise be valid '.

§ 849. Certainly it is sometimes easier to throw a complex sentence into algebraic form than to express it by a logical formula. For example, Menenius says of Coriolanus (Act V, sc. 4)—' He wants nothing of a god but eternity and a heaven to throne in.' Sicinius answers :—' Yes, mercy, if you report him truly.' That is, A god—(eternity + a throne in heaven + mercy) = Coriolanus.

§ 850. We cannot, however, for a moment admit that logic is a branch of mathematics, or that its axioms are ' founded upon and resolvable into the ulterior and more simple ' axioms which underlie the science of numbers. The reasoning process is

absolutely prior to all reasoned knowledge. We could not work out the simplest sum or problem if Logic did not lead us by the hand. Nor yet is it possible to admit that Thought is really but adding and subtracting. Boole affirms that 'the ultimate laws of thought forbid, as it should seem, the perfect manifestation of the science of Logic in any other form' than that of a Calculus. Mathematical language, he maintained, is naturally the universal language of thought. Enough has been said above about the view expressed by De Morgan that 'simple *identity* or *non-identity* is the ultimate state to which every assertion may be reduced'. It is true that every proposition is the statement of identity in difference. One and the same substance underlies the different determinations of subject and predicate. But such identity and such difference are not what the equaters (of whom I would avoid speaking disrespectfully) mean. 'The process of reason,' says Dr. Bradley truly, 'does not consist in substitution,'[1] though in his ardour for logical latitudinarianism this writer hastens to add that 'the method of substitution has set itself free from some of the superstitions of the traditional logic. For certain purposes it is far more useful.'[2]

§ 851. If algebraic or geometrical forms are applicable to logical propositions, it can only be on the side of quantity and extension. The circles and other diagrams used to illustrate syllogistic mood and figure are imperfectly applicable to reasoning in intension.[3] Algebraic expressions again are quantitative. To make x and y the symbols of unknown attributes, and to combine these by $+$, $—$, $\times$ and $\div$, is to confuse quantitative with qualitative relations. Boole, for instance, represents an adjective qualifying a substantive ('rotten apple', 'treasure trove') as $x \times y$. It is, however, 'a fundamental law of thought' that in Logic xx or $x^2 = x$—which is only true in Algebra when $x = 0$ or $x = 1$. A two-footed biped is a biped. A cowardly poltroon is a coward. On this law Boole rests the Principle of Contradiction. For x and

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[1] *Logic*, p. 348.   [2] Ibid. p. 349.

[3] For though a circle in a circle will stand for the proposition that the attributes of animal are included among attributes of cow, the proposition 'A cow is never a pig' cannot be represented, when regarded in comprehension, by two exclusive circles, which would mean that none of the attributes of cow are found among the attributes of pig, or vice versa ; whereas cow and pig have many attributes in common, e. g. four-footedness. See Appendix.

non-x together make up any particular 'universe of discourse'—
e. g. brave and cowardly soldiers. The universe of discourse
(soldier) may be represented by 1. Then $x - x^2 = 0$. That is,
$x(1-x) = 0$. But $1-x = $ non-x (take from the class soldier the
brave soldiers and what is left is the class of non-brave soldiers).
An x which is non-x then is nothing. Self-contradictory attri-
butes (a cowardly brave soldier) have no existence. And so,
remarks Boole in his *Laws of Thought*, 'What has been commonly
regarded as the fundamental axiom of metaphysics is but the
consequence of a law of thought mathematical in form.' As
though the equation could have moved a step except in reliance
on that fundamental axiom !

§ 852. In the 'demonstration' just given, x is after all given a
meaning in extension, $1 - x$ being the whole class *less* the x class.
What then is the meaning of multiplication of x by x, or of x by y ?
'Good man' has an extension less than that of 'man' or than that
of 'good'; but if x stands for *good* and y for *man*, the extension of xy
must equal the extensions of x and y multiplied into one another.
Other equational logicians symbolize 'good man' by $x + y$. A good
man has the qualities both of goodness and of humanity. $x + y$,
then, stands for the entire intension of the term. If x and y
were classes, the sum of the extensions of *good* and of *man* would
again be greater than that of good man. And therefore the
logician must rigidly keep to the meaning in comprehension.
And yet how can reasoning in comprehension be carried on
algebraically ? Are the signs of multiplication and division to be
dropped out ? What will be the force of words like *all, some,
none, except*, or of numbers ? What will be the meaning of 'All x'
or of 'Ten x's' ? Directly we make x mean 'whatever is x', and
$x + y$ mean 'whatever has the qualities of x-ness and y-ness
together', we have got back to classes and to extension.

In Boole's system, if xyz stands for opaque polished stones,
the expression $x(1-y)(1-z)$ means, 'opaque substances which
are not polished and are not stones.'

'Either x or y', if 'or' is not exclusive, is thus represented :—
$x + y(1+x)$—i. e. either x or y or both. If 'or' is exclusive,
thus :—$x(1-y) + y(1-x)$.

'Either x or y or z' in the former case is represented as
follows :—$x + y(1-x) + z(1-x)(1-y)$. In the latter case as
follows :—$x(1-y)(1-z) + y(1-x)(1-z) + z(1-x)(1-y)$.

'All men are mortal', the relationship of species and genus, is symbolized algebraically by $y=vx$, v being an indefinite symbol, a class indefinite in every respect but that some of its members are x, and so the differentia of a definition. Men are *some kind of* mortals. 'Stars are either suns or planets' then becomes :—

$$x=v\{y(\mathrm{1}-x)+z(\mathrm{1}-y)\}.$$

No y is x (All y's are non-x) becomes :—$y = v(\mathrm{1}-x)$. Some y's are not x is :—$vy=v(\mathrm{1}-x)$.

Syllogistically, if $x=vy$ and $y=v'z$, then, by substitution, $x=vv'z$. If dwarfs are small men, and men are food-cooking animals, dwarfs are small food-cooking animals.

The following formula for a division, say of pieces of cloth striped with colours, is not so difficult as it looks at first sight to the non-mathematical reader. Let v stand for *white*, x for *green*, v' for *black*, y for *yellow*, w for *red*, z for *orange*, w' for *blue*. Then remembering that $\mathrm{1}-x$ stands for non-x, $\mathrm{1}-z$ for non-z, &c., $+$ for *or*, and seeking x, we have :—

$$x = \left[vv'\,ww' + \frac{\mathrm{o}}{\mathrm{o}}\{vv'(\mathrm{1}-w)(\mathrm{1}-w')+ww'(\mathrm{1}-v)(\mathrm{1}-v')+(\mathrm{1}-v)\right.$$

$$\left.(\mathrm{1}-w)\}\right]z+\frac{\mathrm{o}}{\mathrm{o}}\{vv'(\mathrm{1}-w')+\mathrm{1}-v\}(\mathrm{1}-z).$$

This, being interpreted, is :—Pieces of cloth striped with green are either striped with orange or not [i. e. the expression has two members, one consisting of z's, the other of non-z's $(\mathrm{1}-z)$]. In the former case they are striped with white, black, red, and blue together ; or else with white and black but not with red and blue ; or else with red and blue but not with white and black ; or with orange alone. In the latter case they are striped with white and black but not with blue, or else with no white stripe at all.[1]

Again, if x stands for *men*, y for *heroes*, z for *practising self-denial*, w for *practising courage*. Then—

$$x(\mathrm{1}-zw)=v(\mathrm{1}-y)$$

means :—'No men are heroes but those who unite the practice of self-denial to that of courage.' Men who do not practise self-denial and courage together are some non-heroes.[2]

If every A is B and every non-A is B, then everything in that universe of discourse is B. Thus :—

Every AC is B, every non-AC is B. Then every C is B.

[1] Boole, *Laws of Thought* (1854), pp. 231 seq.   [2] Ibid. p. 64.

§ 853. 'Conversion,' Boole observes, 'is a particular application of a much more general process in logic which has for its object the determination of any element in any proposition, however complex, as a logical function of the remaining elements.'[1]

Thus, $y = vx$, then $x = y + \frac{0}{0}(1-y)$. Things that are x's comprise all things that are y's and an indefinite remainder of things that are not y's. Pomegranates are a kind of fruit. Then the class *fruit* comprises all pomegranates and an indefinite number of things that are not pomegranates.

§ 854. Inference, he says, consists in the elimination of those elements in the premisses which we do not wish to appear in the conclusion. What is wanted is a mechanical method of eliminating any number of middle terms by combining equations. Such a method will enable 'the desired relation' to be obtained, that is 'the full relation which in virtue of the premisses connects any elements selected out of the premisses at will, and which, moreover, expresses that relation in any desired form and order'.

§ 855. We may glance for a moment at some features of Jevons' scheme. He represents by A an intensive quality, by (A) the number of things (extension) possessing that quality. Then if $A = B$, $(A) = (B)$. 'Sameness of qualities occasions sameness of numbers.' He is taken aback, however, by the impossibility (see above, §§ 684 seq.) of representing a negative proposition in extension as an equation. 'Curiously enough, this does not apply to negative propositions and inequalities.' If $B \smile D$ (differs from D) it does not follow that $(B) \smile (D)$. Two classes of objects may differ in qualities and yet agree in number.

Jevons represents non-A by a, non-B by b. For unexclusive disjunction (either, or) he uses the sign $\dagger$. Thus 'A is either B or C' takes the form—$A = B \dagger C = BC \dagger Bc \dagger bC$. Such a sentence as this, 'An elector is either an elector for a borough, a county, or a university,' would be stated thus :—

$A = B \dagger C \dagger D$.   Then

$(A) = (BCD) + (BCd) + (BcD) + (Bcd) + (bCD) + (bCd) + (bcD)$.

That is,

All electors are so either for borough, county and university,

---

[1] Op. cit. p. 230.

or for borough and county but not university, or for borough
and university but not county, or for borough but not county
or university, &c.

§ 856. The Law of Duality, as he terms the principle of
Excluded Middle, may be symbolized as $A = AB + Ab$. And
again, $A = AC + Ac$. A law may be kind or unkind, logical
or illogical. Then

Laws are either kind and logical, or kind and illogical, or
logical and unkind or neither kind nor logical.

$$A = ABC + ABc + AbC + Abc.$$

And so on with any number of terms. Jevons devised an
abacus for working the method mechanically.

He gives the following problem :—

In every 100 A's there are 45 B's and 53 C's. Also wherever
the attribute B is found the attribute C is found. Required to
determine in how many cases C occurs without B, and in how
many cases neither B nor C occur. Then

$$(A) = 100 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (1)$$
$$(B) = 45 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (2)$$
$$(C) = 53 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (3)$$
$$B = BC$$
$$\text{i.e. } (B) = (BC), \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (4)$$
$$\text{and } (Bc) = 0 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (5)$$

Then by Law of Duality

$$(C) = (BC) + (bC) = (B) + (bC)$$

That is, $53 = 45 + (bC)$.

Then (bC) (i. e. C without B) = 8.

Again,

$$(A) = (ABC) + (ABc) + (AbC) + (Abc).$$

That is, $100 = 45 + 0 + 8 + (Abc)$.

Then (Abc) (i. e. A without either B or C) = 47.

This certainly seems a rather roundabout solution ; for the
first *quaesitum* is obtained at once by subtracting 45 from 53, and
the second by subtracting 53 from 100—since the 53 C's include
the 45 B's.

Jevons quotes from De Morgan[1] the following argument,
'which cannot be put into any ordinary form of the syllogism':—

'For every man in the house there is a person who is aged.

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[1] *Syllabus of Proposed System of Logic*, 1860, p. 29.

Some of the men are not aged. It follows that some persons in the house are not men. How many?'

Let A stand for *man*; B for aged person; w for excess, if any, of aged persons over men; w' for not-aged men. Then

$$(A) = (B) - w \qquad\qquad\qquad (1)$$

$$(Ab) = w' \qquad\qquad\qquad\qquad (2)$$

By the Law of Duality

$$(AB) + (Ab) = (AB) + (aB) - w$$

Then $(aB) = w + w'$ . . . . . (3)

Adding (ab) to both sides, then, since $aB + ab = a$,

$$(a) = w + w' + (ab).$$

w and (ab) are unknown quantities, and must be positive, not negative, if anything at all.

§ 857. The following is the formula for Ultra-dimidiate Quantification of the Middle Term :—

Most B's are A's . . . . . (1)

Most B's are C's . . . . . (2)

Therefore Some C's are A's . . . (3)

Then

$$(AB) = \frac{B}{2} + w \qquad\qquad\qquad (1)$$

$$(BC) = \frac{B}{2} + w' \qquad\qquad\qquad (2)$$

Then

$$(AB) + (BC) = B + w + w'.$$

Developing the logical terms on either side we get—

$(ABC) + (ABc) + (ABC) + (aBC) = (ABC) + (ABc) + (aBC) + (aBc) + w + w'.$

[That is, the B's which are both A and C, and those which are A without being C, added to the B's which are both C and A and those which are C without being A, are numerically equal to the B's which are both A and C, and those which are A without being C, added to the B's which are C but not A, and those which are neither C nor A, added to the number of B's which are A in excess of half the B's and the number of B's which are C in excess of half.]

Then $(ABC) = w + w' + (aBc).$

[That is, the B's which are both A and C (in other words, the number of C's which are A) are equal in number to the B's which are neither A nor C in addition to the ultra-dimidiation in either case. Accordingly, Some C's are A.]

§ 858. From the ordinary syllogism in *Barbara* (All A's are B, all B's are C, all A's are C), which is represented thus—

$$B = BC$$
$$A = AB$$
therefore $A = AC$,—

we can discover the relative values of B and of C as well as of A.

$$(abC) = (C) - (A) - (aBC)$$

Then $(C) = (A) + (aBC) + (abC)$.

[That is, if A stands for kings, B for humans, C for mortals, the extension of *mortal* will be all the kings, together with the human mortals who are not kings, and the mortals who are neither kings nor human.]

And $(B) = (ABC) + (aBC)$.

[That is, the extension of *human* will be all the mortal humans whether royal or not.]

§ 859. Jevons admits that the results can be reached by common sense or ordinary mathematical calculation :—

'But what I claim for my logical method and notation is that it is in no sense peculiar, but represents truthfully and completely the natural course of intelligent thought . . . It is metaphysical speculation which has mystified the subject and rendered [Logic] the laughing-stock of scientific men . . . I hold that Logic can only be regenerated by those who will render themselves acquainted with the exact methods of research which lead to undoubted truths in the mathematical and physical sciences. Logic, in short, must be dissociated from metaphysics, with which it has no necessary connexion, and must become an exact science.'

§ 860. He proposes a table setting forth the legitimate variations of the combinations of three terms, A, B and C, with their negatives a, b and c. The possible combinations are eight— *ABC, aBC, AbC, ABc, Abc, aBc, abC,* and *abc.* These eight may be varied in 2^8 possible ways, $= 256$, of which 63 may be struck out, leaving 193. Jevons says :—'Such a table enables us to learn by mere inspection the laws obeyed by any set of combinations of three things, and is to Logic what a table of factors and prime numbers is to the theory of numbers, or a table of integrals to the higher mathematics.' Beyond three terms the labour would be impossibly great. Four terms (2^{16})

gives 65,536 combinations.   Five terms 4,294,967,296.   Six terms gives eighteen millions of millions of millions.[1]

§ 861. An equational theory of reasoning involves the question of Added Determinants.   For whatever is done to one side of an equation, whether adding, subtracting, multiplying or dividing, must be done to the other. $S = sM$.   But $M = a + b$.   Therefore $S = s(a+b)$.   But if s be a relative term (A dwarf is a small man ; Man is an animal ; Therefore a dwarf is a small animal), a fallacy awaits the too mathematical reasoner, the fallacy *a dicto secundum quid ad dictum simpliciter*.

The following looks like a good equation.   It might be held that a person three parts mad was three parts irresponsible. This gives us mad = irresponsible.   But also a cup half full is a cup half empty.   Then full = empty !

§ 862. Again, given a syllogism based on substitution of equivalents, the parts of the syllogism can be placed in any order we please.   Thus, instead of $S = M$, $M = P$, therefore $S = P$, we might argue, $S = M$, $S = P$, therefore $M = P$; or, $M = P$, $S = P$, therefore $S = M$.

§ 863. In the ordinary syllogism, on the other hand, we can never by combining the conclusion with one of the premisses deduce the other premiss.   This can be shown as follows :—

(1) The premiss which is retained cannot be a negative or particular proposition, for, if so, the old conclusion was negative or particular (§ 728).   As this is now to be combined with the retained premiss, we should have in the new syllogism two negative or two particular premisses, which cannot be allowed (§§ 723, 724).   The retained premiss, then, is neither E, I nor O, but must be A.

(2) The former extreme of the retained premiss is, of course, the new middle term.   It must therefore be a distributed term ; for, unless it were so (since neither could it be found distributed in the old conclusion, which is now the new premiss, § 730), we should have in the new syllogism an undistributed middle, from which nothing can be deduced.   But in an A proposition the distributed term is the subject.   Accordingly, since the retained premiss is

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[1] The reader is referred to a Paper prepared by Professor Jevons for the Manchester Literary and Philosophical Society, ' On a General System of Numerically Definite Reasoning,' and to another Paper ' On the Mechanical Performance of Logical Inference ' (1870).

an *A* proposition, the old middle term, which is now the extreme of the retained premiss, must be its predicate, and therefore undistributed. But since, as middle term, it must have been distributed once at least in the original syllogism and was not distributed in the retained premiss, it was clearly distributed in the suppressed premiss. Being, however, undistributed, and an extreme, in the retained premiss, the old middle necessarily reappears undistributed in the new conclusion. The new conclusion then cannot be identical with the suppressed premiss, where it was, as we have seen, distributed. Nor can it be converted into the suppressed premiss, for conversion never increases the quantity of a term.[1]

§ 864. It is plain, then, that there can only be one way of putting together three given propositions so as to frame a valid syllogism. Also that being given three propositions capable of forming a valid syllogism we can always construct it.

§ 865. It follows further that, if from the truth of one premiss and conclusion the truth of the other premiss cannot, as we have seen, be demonstrated, it is possible that this premiss may be false though the conclusion is actually true. People are apt to conclude that an assertion is untrue as soon as they find it to be held on untenable grounds. Practically they may be right; for the assertor would probably have chosen a better line of argument had it been possible. But it need not be so. It is even more common for premisses to be accepted without examination because they lead to an acceptable conclusion, that is, one assented to as true. As Hamilton says, 'An inference may be subjectively or formally true which is objectively or really false.'[2] But it may be both subjectively true (i. e. as an inference) and objectively true (i. e. as a proposition) and yet be supported by false arguments.[3]

§ 866. The possible inter-relations of the extensions of three terms *A*, *B* and *C*; each of which may be in turn major, minor

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[1] I have borrowed the foregoing proof, in substance, from Professor W. H. S. Monck's *Introduction to Logic*, 2nd ed., pp. 201-3.

[2] *Lectures on Metaphysics*, ii. 343.

[3] With Mill I wholly fail to understand Hamilton's protest against the 'doctrine prevalent among logicians . . . that it is possible to infer true from false, but not false from true', and his contention that this doctrine is 'subversive of the distinction of logic as a purely formal science' (*Lectures on Logic*, i. 450, 451 ; see Mill on Hamilton, pp. 522 seq.).

.or middle, may be stated as follows, the consequences being visible at a glance:—

(I) Either two extensions, B and C, are together coincident with the third, A—

either thus (*a*)   or thus (*b*)
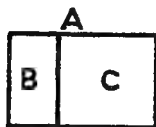
$\begin{cases} \textit{Ferio} \\ \textit{Felapton} \\ \textit{Fesapo} \end{cases}$
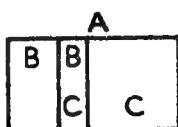
$\begin{cases} \textit{Darii} \\ \textit{Datisi} \\ \textit{Disamis} \\ \textit{Bocardo} \end{cases}$

(II) Or both, viz. B and C, are wholly included in the third, A ; in which case either

(*a*) C is wholly outside B
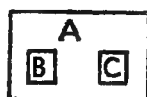
$\begin{cases} \textit{Felapton} \\ \textit{Fesapo} \end{cases}$

or (β) C is wholly inside B [or B may be wholly inside C]
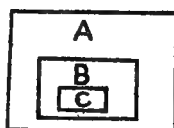
$\begin{cases} \textit{Barbara} \\ \textit{Bramantip} \\ \textit{Darii} \\ \textit{Darapti} \\ \textit{Disamis} \\ \textit{Datisi} \\ \textit{Dimaris} \end{cases}$

or (γ) C partly coincides with B
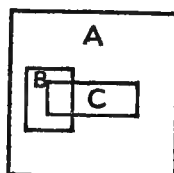
$\begin{cases} \textit{Darii} \\ \textit{Disamis} \\ \textit{Dimaris} \end{cases}$

(III) Or one only, e. g. B, is wholly included in the third, A ; in which case

either (*a*) C is wholly outside A
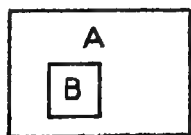
$\begin{cases} \textit{Cesare} \\ \textit{Celarent} \\ \textit{Camestres} \\ \textit{Camenes} \end{cases}$

or (β) C is partly outside A, in which case either (i) it is wholly excluded from B

$\left\{\begin{array}{l}\textit{Ferio}\\ \textit{Felapton}\\ \textit{Fesapo}\end{array}\right.$
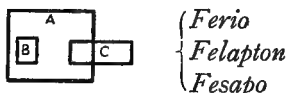
or (ii) it partly coincides with B

$\left\{\begin{array}{l}\textit{Darii}\\ \textit{Disamis}\\ \textit{Datisi}\\ \textit{Dimaris}\\ \textit{Baroco}\\ \textit{Bocardo}\end{array}\right.$
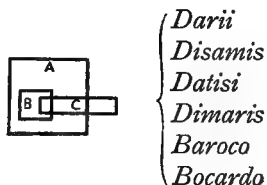
or (iii) it wholly includes B

$\left\{\begin{array}{l}\textit{Darii}\\ \textit{Darapti}\\ \textit{Dimaris}\end{array}\right.$

(these diagrams under (III) will be reversed if it be C which is included in A)

(IV) Or neither B nor C is wholly included in A; in which case either (a) both are wholly outside A

no syllogism possible, everything being negative.
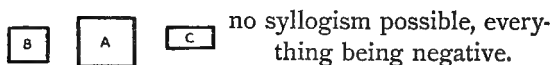
or (β) one, e. g. B, is wholly outside A, while C partly coincides with A.

$\left\{\begin{array}{l}\textit{Ferio}\\ \textit{Festino}\end{array}\right.$
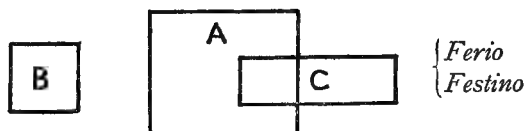
or (γ) both B and C partly coincide with A; in which case, either (i) they partly coincide with each other

no universal, and therefore no syllogism.
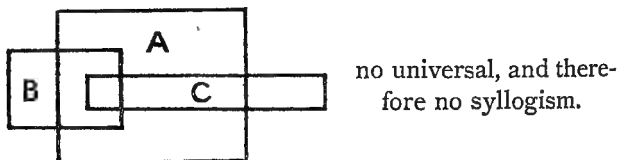
or (ii) the one includes the other
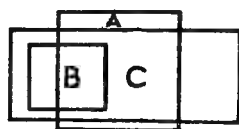
$$\begin{cases} Darii \\ Disamis \\ Datisi \\ Dimaris \\ Baroco \\ Bocardo \end{cases}$$

or (iii) they do not coincide at all
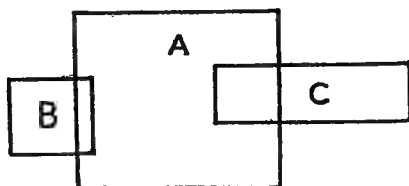
$$\begin{cases} Ferio \\ Festino \\ Ferison \\ Fresison \end{cases}$$

These diagrams exhaust, I think, the possible relations of three extensions—omitting, however, the cases of all three coinciding, or of any two exactly coinciding. Coincidence cannot be expressed save by quantifying the predicate—All *B* is all *C*. A disjunctive judgement, *A* is either *B* or *C*, may be shown as (I) (*a*) or (I) (*b*) above, or thus—
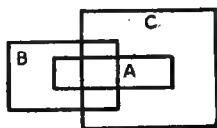
or thus—
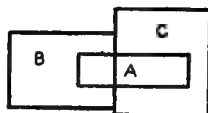
In the first and fourth of these *B* and *C* are mutually exclusive.

§ 867. Various methods of notation have been proposed for visualizing the extension of the nineteen syllogistic Moods. The following linear scheme, based on the idea of subsumption, the falling of the extension of one term under that of another, is here suggested as the simplest. Lines protracted on the opposite

side, be it to right or left, of the vertical line represent exten-
sions which do not fall under those on the other side. 'Some'
requires a possible protraction of the same line, indicated thus—
S', M' or P'. Non-protraction indicates a negative extension
Thus in *Celarent*, All M is non-P, in Ferio, Some S (at least) is
non-P. Notice that the line S' is not necessarily in the same
place as P.

Figure I.

In this figure M is in the middle place.

Barbara		All M is P All S is M All S is P.
Darii		All M is P Some S is M Some S is P.
Celarent		No M is P All S is M No S is P.
Ferio		No M is P Some S is M Some S is not P.
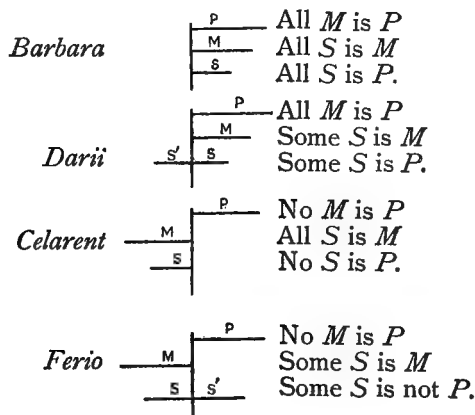
Figure II.

Here M is at the top, and both the other extensions fall
(positively or negatively) under it.

Cesare		No P is M All S is M No S is P.
Festino		No P is M Some S is M Some S is not P.
Camestres		All P is M No S is M No S is P.

Baroco

All P is M
Some S is not M
Some S is not P.
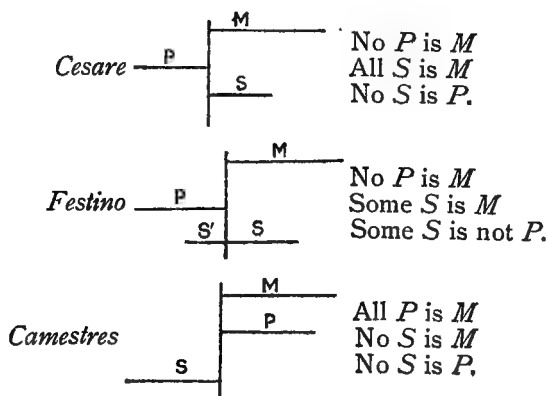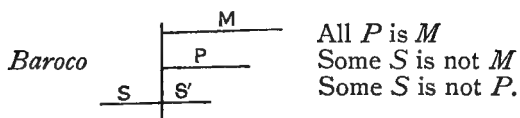
Neither *Camestres* nor *Baroco* needs in this notation any transposing of premisses.

Figure III.

Here M is at the bottom, and falls (positively or negatively) under the extensions both of P and of S.

Darapti

All M is P
All M is S
Some S is P.

Datisi

All M is P
Some M is S
Some S is P.

Disamis

Some M is P
All M is S
Some S is P.

Felapton

No M is P
All M is S
Some S is not P.

Ferison

No M is P
Some M is S
Some S is not P.

Bocardo

Some M is not P
All M is S
Some S is not P.
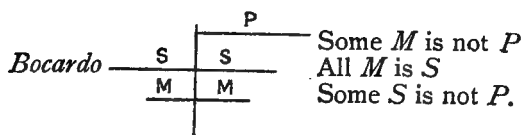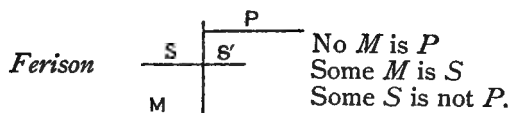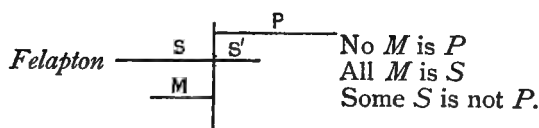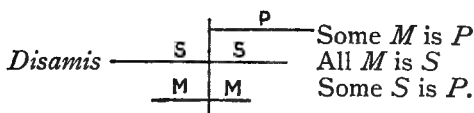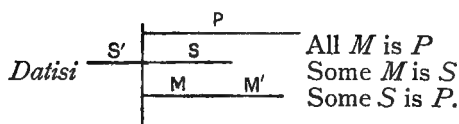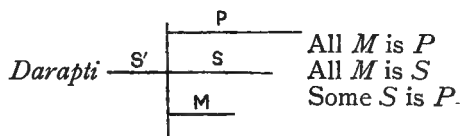
Figure IV.

In this figure M is in the middle place. But S appears above P.

Bramantip

All P is M
All M is S
Some S is P
(All P is S).

Dimaris

Some P is M
All M is S
Some S is P
(Some P is S).

Camenes

All P is M
No M is S
No S is P
(No P is S).

Fesapo

No P is M
All M is S
Some S is not P.

Fresison

No P is M
Some M is S
Some S is not P.
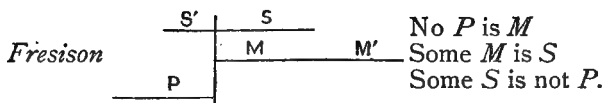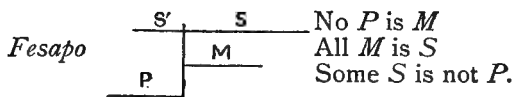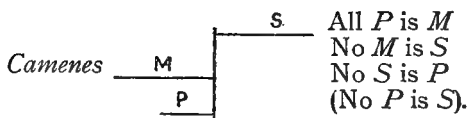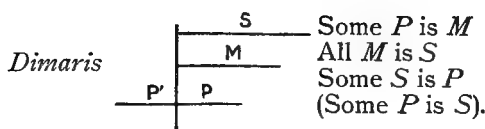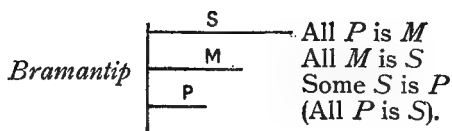
The diagram of each Mood should be compared with that of the Mood or Moods to which it can be reduced, e. g. *Fesapo* is *Ferio* upside down.

§ 868. A Sorites, or chain of arguments, is thus represented in Figure I :—

Affirmative. Negative.

All *L* is *A*
or Some *L* is *A*.

No *L* is *A*
or Some *L* is not *A*.
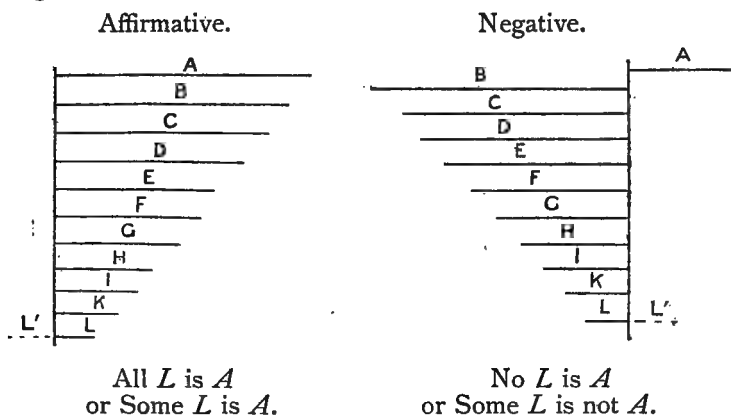
§ 869. 'The chief end of any adequate system of notation,' remarks Devey, 'is to present to the eye, by a species of symbolical language, all the intricate relations which subsist between terms in a syllogism, so that no point may be overlooked which has any bearing on the conclusion, and the inference be viewed in all the various shapes which the premisses allow it to assume.'[1]

[1] *Logic*, p. 126.

CHAPTER XXVI

ELLIPTICAL REASONINGS

§ 870. THE Sorites is a compendious polysyllogism, usually in the First Figure, which if stated argumentatively must be broken up into a series or concatenation of syllogisms, the conclusion of each prosyllogism being the minor premiss of the proximate episyllogism. Thus—

Minor	Major	Conclusion
A is B	B is C	A is C
A is C	C is D	A is D
A is D	D is E	A is E
A is E	$\begin{cases} E \text{ is } F \\ E \text{ is not } F \end{cases}$	$\begin{cases} A \text{ is } F \\ A \text{ is not } F \end{cases}$

In the Sorites the conclusions are omitted until the last one is reached. A is B, B is C, C is D, D is E, E is F (or E is not F). Therefore A is F (or A is not F).

§ 871. The following poetical Sorites is by Sir Thomas Wyatt (1503–44)—

> The longer life the more offence,
> The more offence the greater paine,
> The greater paine the lesse defence,
> The lesse defence the lesser gaine ;
> The loss of gaine long yll doth trye,
> Wherefore come death and let mee dye.

> The shorter life, less count I finde,
> The lesse account the sooner made,
> The account soon made, the merier minde,
> The merier mynd doth thought evade,
> Short life in truth this thing doth trye,
> Wherefore come death and let mee dye.

> Come gentle Death, the ebbe of care,
> The ebbe of care the flood of life,
> The flood of life the joyfull fare,
> The joyfull fare the end of strife,
> The end of strife that thing wish I ;
> Wherefore come death and let mee dye.

§ 872. When represented by a notation, whether of subordinate lines or of circles one within another, though there appears to be nothing compendious in the argument, the eye at once sees that *A* is *F*, or not *F*. Yet it is too much to say with Hamilton that 'the relation is equally cogent and equally manifest between a whole and a remote, and a whole and a proximate part'.[1] In a notation *A* is ascertained to be *F*, not through the mediation of *B*, *C*, &c., but at a glance. But in strictness the eye should be allowed to see only two lines or circles at a time.

§ 873. Aristotle does not speak of the Sorites; but the principle of it is contained in the Aristotelian rule, *praedicatum praedicati est praedicatum subiecti*, which is really the *dictum de omni et nullo*. Whatever is affirmed or denied of an entire class may be affirmed or denied of whatever is contained in that class. The affirmation of the ground involves that of every consequence of its consequence, till the first ground is connected with the last consequence.

§ 874. It will be observed that, since every unexpressed conclusion has to serve as a minor premiss, all (in a scheme based on the First Figure) must be affirmative; also that the last *datum* before the conclusion may be negative. Thus—
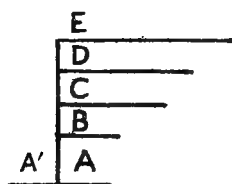
Some *A* is *B*, All *B* is *C*, All *C* is *D*, All *D* is *E*; then Some *A* (at least) is *E*. A particular proposition after the first would invalidate the reasoning. Again—

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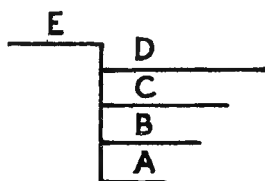
[1] *Lectures on Logic*, i. 371.

All *A* is *B*, All *B* is *C*, All *C* is *D*, No *D* is *E*; then No *A* is *E*. A negative proposition before the last would make the chain invalid. Thus—
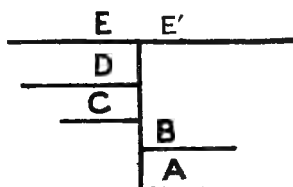
All *A* is *B*, No *B* is *C*, All *C* is *D*, All *D* is *E*. Evidently it does not follow that any *A* is, or is not, *E*. A particular negative conclusion is obtained thus—
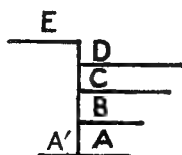
Some *A* is *B*, All *B* is *C*, All *C* is *D*, No *D* is *E*; then Some *A* (at least) is not *E*.

§ 875. If, instead of the last step being No *E* is *F*, we end thus, No *F* is *E*, the final syllogism of the Sorites appears in the Second Figure as *Cesare* or *Festino*. We might end, No *E* is *G*,
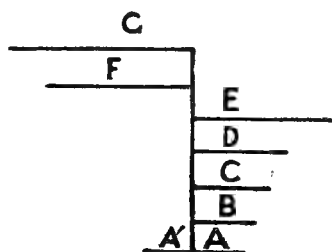
All *F* is *G*, which would give *Camestres* or *Baroco*. But this running to and fro between the terms would be destructive of the chain. It is really destroyed also by a final syllogism being obtained in the Third Figure; which may be done if at the

lower end of the series A to E we insert, 'A (all or some) is G.'
It follows, all A being E, that some G is E (*Darapti* or *Datisi*).
Mill remarks that this kind of Sorites 'all logicians have
admitted'.[1] But it is really a combination of two lines of argu-
ment, and not an orderly concatenation.
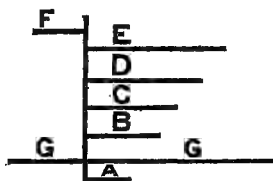
Some A is E, All A is G, will also give Some G is E (*Disamis*).
No A is F, All A is G, gives Some G is not F (*Felapton*).
No A is F, Some A is G, gives Some G is not F (*Ferison*).
Some A is not F, All A is G, gives Some G is not F (*Bocardo*).

§ 876. Mill rightly rejects Hamilton's paradigms in which all
the steps are in the Second or in the Third Figure. 'No B is A,
No C is A, No D is A, No E is A, All F is A ; therefore No B or
C or D or E is F.' Or again, 'A is B, A is C, A is D, A is E,
A is F; therefore some B and C and D and E are F.' There
is here only one middle term, rather than a successive chain of
middle terms. 'Neither of these is a Sorites at all. It is not
a chain argument. It does not ascend to a conclusion by a
series of steps, each introducing a new premise. It does not
deduce one conclusion from a succession of premises, all
necessary to its establishment. It draws as many different con-
clusions as there are syllogisms, each syllogism depending only
on the two premises of one syllogism. . . . [Each] would be
proved, though all the other premises of the pretended Sorites
were rejected.'[2] Yet Hamilton complains that 'all logicians
have overlooked the Sorites of Second and Third Figures'.[3]
Elsewhere he says, 'The Sorites is capable of all the four
schematic accidents by a little contortion ; but this at best con-
stitutes only a logical curiosity.'[4]

§ 877. It is of no consequence from which end the Sorites
starts. The difference between saying, 'A is B, B is C, C is D,

[1] *On Hamilton*, p. 530. [2] Ibid. p. 531.
[3] *Lectures on Logic*, ii. 395. [4] Ibid. i. 448.

D is *E*; therefore *A* is *E* ' (Progressive Sorites), and saying, '*D* is *E*, *C* is *D*, *B* is *C*, *A* is *B*; therefore *A* is *E* ' (Regressive Sorites) is merely the difference between stating minor premiss before major, in *Barbara*, or major premiss before minor. That in the former order the predicate of each proposition is the subject of the next, and in the latter order the subject of each proposition is the predicate of the next, constitutes no difference, except in the point of view. But Hamilton elevates a mere variation in the order of argument into a vital difference between two forms of reasoning, that in 'the quantity of extension' and that in 'the quantity of comprehension'. Strangely enough (he says) the sequacious logicians, who usually so blindly ignore the latter kind of reasoning, have here fallen into the opposite error. And 'what renders it still more wonderful that the logicians did not evolve the competency of [the Sorites] in either quantity, and thus obtain a key to the opening up of the whole mystery of syllogistic reasoning, is this—that it is now above two centuries since the Inverse or Regressive Sorites in comprehension was discovered and signalized by Rodolphus Goclenius, a celebrated philosopher of Marburg. This Sorites has from him obtained the name of *Goclenian*.' [1]

§ 878. I confess to having completely failed to understand which Sorites Sir William Hamilton means by the one in extension and which by the one in comprehension. He gives the following from Seneca, which follows the order of the 'common' Sorites, *A* is *B*, *B* is *C*, &c.—

> 'He who is prudent is temperate,
> He who is temperate is constant,
> He who is constant is unperturbed,
> He who is unperturbed is without sorrow,
> He who is without sorrow is happy;
> Therefore the prudent man is happy '—

and goes on :—

'In this Sorites everything glides easily and smoothly from the whole to the parts of comprehension. But though the process will be rather more by hitches, the descent under extension will, if not quite so pleasant, be equally rapid and certain.

> He who is without sorrow is happy,
> He who is unperturbed is without sorrow,

[1] Op. cit. i. 383.

He who is constant is unperturbed,
He who is temperate is constant,
He who is prudent is temperate,
Therefore the prudent man is happy.'

Why the former is more in comprehension and less in extension than the latter it is impossible to understand. 'In the Progressive Sorites of comprehension,' he says, 'and in the Regressive Sorites of extension, the middle terms are the predicates of the prior premises, and the subjects of the posterior; the middle term is here in position intermediate between the extremes.'[1] How is this exemplified in the above regressive Sorites, which, he declares, is a 'descent in extension'? It is the opposite, we are told, in 'the Progressive Sorites of extension and the Regressive Sorites of comprehension'. Hamilton gives as an example of the latter—

'An animal is a substance,
A quadruped is an animal,
A horse is a quadruped,
Bucephalus is a horse,
Therefore Bucephalus is a substance.'[2]

Of the former, the same propositions in the same order, but differently explicated. The explication of Regressive Comprehensive is—

The notion animal comprehends the notion substance;
The notion quadruped comprehends the notion animal, &c.

Of the Progressive Extensive—
The notion animal is contained under the notion substance;
The notion quadruped is contained under, &c.

Progressive Extensive and Regressive Extensive are explicated alike, but in inverse order, and Progressive Comprehensive and Regressive Comprehensive also.

§ 879. According to Hamilton, a proposition is in extension or in intension, not as it is worded but according as we 'explicate' its meaning to be either 'Notion X is contained under notion Y', or 'Notion X comprehends the notion Y'. So elsewhere, 'The term Caius contains in it the term Man.'[3] I submit once more, however, that X is not as a notion but as a class contained under

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[1] Op. cit. i. 379.
[2] So also Veitch, *Institutes*, p. 446.   [3] Op. cit. i. 296.

Y, and that *Y* is comprehended not in the notion, or term, *X* but among the attributes possessed by the class *X*. If we wish to state a proposition in extension, we must say, '*X* is a *Y*, belongs to the class *Y*.' If in intension, we must say, '*X* has the attribute *Y*-ness.' Or otherwise—'The class *Y* includes *X*' (extension). 'The attribute *Y*-ness belongs to *X*' (intension). In such an example as Hamilton gives, the notion *temperate* may be comprehended in the notion *prudent*. But can we say that the notion *tiresome* is comprehended in the notion *boy*? 'Bucephalus is a horse' Hamilton explicates thus—'The *representation* Bucephalus comprehends the notion horse' (comprehensive); 'is contained under the notion horse' (extensive).

§ 880. A Sorites in comprehension will either be progressive—*A* has the attribute *B*-ness, *B* (i. e. whatever has the attribute *B*-ness) has the attribute *C*-ness, &c.—or regressive :—*E*-ness is an attribute of *D* (things which have the attribute *D*-ness), *D*-ness is an attribute of *C*, &c.

§ 881. A Sorites may be cast in hypothetical form :—If *A* is, *B* is; if *B* is, *C* is, &c. ; therefore if *A* is, *E* is. This is logically equivalent to All *A* is *B*, All *B* is *C*, &c. Or more fully—If *A* is *B*, *C* is *D*; if *C* is *D*, *E* is *F*; if *E* is *F*, *G* is *H*. Therefore if *A* is *B*, *G* is *H*. Regressively these will become—*E* is if *D* is ; *D* is if *C* is, &c. Again, *G* is *H* if *E* is *F*; *E* is *F* if *C* is *D*, &c.

To posit now that *E is F* will not carry with it the consequence that *G* is *H*, unless all the other suppositions are true also. But if we deny that *G* is *H*, all the prior propositions fall to the ground, as propositions, though not, of course, as consequences.

To prove *G* to be *H* we should have to say, '*G* is *H* if *E* is *F*; now *E is F*, because *C* is *D* ; and *C* is *D* because *A* is *B*.' Or, in casting about for some firm foundation for the statement that *G* is *H*, we say, '*G* is *H* if *E* is *F*; and *E* is *F* if *C* is *D*; and *C* is *D* if *A* is *B*. But *A is B*; therefore *G* is *H*.' Such a regressive argument is employed when we are seeking for a proof; the progressive order when we are examining consequences. The way, then, in which Hamilton states the regressive Hypothetical Sorites is not quite natural :—

> If Harpagon be discontented he is unhappy ;
> If intent on gain he is discontented ;
> If avaricious he is intent on gain ;

Now Harpagon is avaricious.

Therefore he is unhappy.[1]

It would be more natural to say :—

Harpagon is unhappy if he be discontented.

He is discontented if intent on gain, &c.

This illustration takes the following form, progressively—

If A is B it is C.
If A is C it is D.
If A is D it is E—

('A is C', 'A is D,' corresponding to middle terms) ; and regressively)—

A is E if it is D.
A is D if it is C.
A is C if it is B.

The *modus ponens* is—A is B ; therefore it is C and D and E. And B is C, and C is D, and D is E.

The *modus tollens*—A is not E ; therefore it is neither D nor C nor B. Yet D is E, and C is D, and B is C.
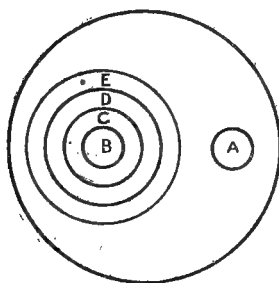
§ 882. A Disjunctive Sorites takes the following form :—

A is either B or C.

B is either D or E.	C is either F or G.
D is either H or I.	F is either M or N.
E is either K or L.	G is either O or P.

Therefore A is either H or I or K or L or M or N or O or P.
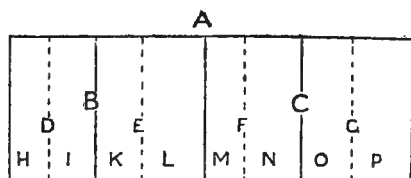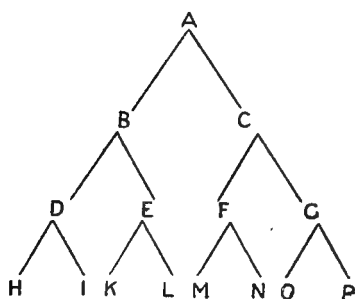
If now we posit, A is B, it follows that A is either H or I or K or L. If A is C, it is either M or N or O or P.

But if A is none of these, then it is neither A nor B.

§ 883. Sorites, the piler-up, is a name given to the chain-argument by transference. Both are rather compendious than elliptical arguments, the conclusion being held in reserve and gathering force at each step. We must go on to consider arguments which are really elliptical, that is where some element of the syllogism is understood but altogether omitted.

§ 884. An argument with either of the premisses, or the conclusion, suppressed is usually called an Enthymeme, which is explained as the holding back something in the mind. Mansel points out that ἐνθύμημα cannot mean this, but seems rather to mean a thought suggested.[1] He shows that Aristotle's Enthymeme is not an argument with any part suppressed, but an inconclusive syllogism in which an inference is rather suggested than proved. Aristotle defines it as συλλογισμὸς ἐξ εἰκότων ἢ σημείων. The εἰκός is a probability. 'She to her father lied; why not to thee?'

> Most men who envy, hate;
> This man envies;
> Therefore this man (probably) hates.

I do not know why Mansel says that 'the reasoning is logically faulty', the middle term being undistributed. It follows absolutely that there is a probability that 'This man hates', for

[1] *Aldrich*, App. F.

'Most men who envy hate' implies that every man who envies is probably a hater.

§ 885. The εἰκός need not necessarily be the major premiss.

> All fierce creatures are dangerous,
> Most caged creatures are fierce ;
> Therefore this caged creature is probably dangerous.
> (It would be best not to go too near.)

§ 886. The σημεῖον or Indication is usually the minor premiss of a halting syllogism in Figure II.

> Those who take scarlet fever have sore throats,
> This child has a sore throat ;
> Therefore, probably, it has taken scarlet fever.

'Perhaps' is all that the premisses strictly allow. The sore throat is an indication *suggesting* fever only. We recognize the old defect of the *ratio cognoscendi*. Sore throat may be a mark or sign, but it is not an infallible sign, of the malady ; for you may have sore throat without having scarlet fever. The middle term is undistributed.

Again—

> How know you I am in love ? By these marks, &c.
>> (*Two Gentlemen.*)

But here the marks are *propria* and τεκμήρια.

§ 887. In Figure II there is an illicit process of the minor term, if we go beyond a peradventure.

> Every intelligent man is a whig (or tory).

X is a whig (or tory). He is sure then to be an intelligent man. If what is meant in the major is that a man *proves* his intelligence by being a whig (or tory), the inference is valid. But formally it is fallacious.

Yet we frequently argue in this way, and, if we have observed a good many instances of two attributes being combined in one subject, we are often safe in doing so. The one attribute is a probable indication of the other's presence.

§ 888. In the First Figure there cannot be anything short of proof, unless for the particular conclusion of *Darii* or *Ferio* we substitute a universal, which would be mere guessing. 'Some *S*'s at least are *P* ; therefore all probably are.' But we often

frame a formally invalid mood with a negative minor premiss, and jump to a conclusion. E. g.—

> The brave are modest.
> William is not brave.

Probably therefore he is not modest. His not being brave suggests it, is an indication of it.

So much in these and similar reasonings depends on material considerations. The inferences we draw from moment to moment are nearly all of this kind, probability being the very guide of life. We must be always adventuring something. Our logic is correct enough, but our premisses seldom warrant a universal. Yet there is more than one Perhaps which not to put to the touch would be cowardice and treason.

§ 889. Our present subject, however, is not reasoning about probabilities, but reasoning not fully expressed in words. As the two things have no kind of connexion, it would be better to discard the name Enthymeme, however time-honoured, to represent the latter, and to call this simply the Elliptical Argument.

As Hamilton says : 'A syllogism is considered by the logician not in relation to its expression (οὐ πρὸς τὸν ἔξω λόγον), but exclusively as a mental process (ἀλλὰ πρὸς τὸν ἐν τῇ ψυχῇ λόγον).' [1]

§ 890. For rhetorical reasons, however, and for brevity, mankind seldom states its syllogisms in full. Brevity is especially the soul of epigram. Sometimes one premiss is omitted, sometimes there is scarcely a rag of either ; sometimes the conclusion is left unexpressed. We say : 'I leave you to draw your own conclusions.' Occasionally all that is expressed of a syllogism is one premiss. Constantly we leap over several intermediate steps. There are several syllogisms, e. g., contained in 'The kitten can get through that hole, since the cat did '.

§ 891. American humour often consists in an extreme abbreviation of the argument, 'The youth looked down the muzzle to see if the gun were loaded. The coroner's jury decided that it was.' The President of a South American republic remarked that the lack of interest taken in public affairs was the country's

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[1] *Lectures on Logic*, iii. 388. He is quoting Aristotle, *An. Post.* i. 10, 7. Veitch (p. 447) cites a remark of Duncan's :—' Dicitur syllogismus imperfectus non respectu mentis sed probationis. Nam in mente proponentis integer esse potest et solidus syllogismus, etsi proferatur truncatus.'

curse. He had not been shot at for at least a fortnight.[1] Or the humour may be unconscious—'Go and see what Baby is doing, and tell him not to'. The omitted premiss is often a sly insinuation, as when in the play some one says: 'It is of no use crying over spilt milk. It only makes it more watery.' Or the philosopher's, 'Be serious. Here comes a fool.' The jest is spoilt by supplying the missing step or steps. A rhetorical statement also gains in impressiveness by assuming that the omitted premiss is so certain and familiar that it needs no stating. 'Confide; scias te Caesarem vehere' (to the shipman in the storm). It is related of Sir Thomas Brisbane, when serving under Abercromby in the West Indies, that on his way to capture a fort he was met by a brother officer who said it could not possibly be taken. 'It can,' he replied, 'I have the order in my pocket.' Phocion, being told that men praised him, asked, 'Have I, then, done anything wrong?'

§ 892. The following are examples of a conclusion followed by a single premiss :—

Deus patiens, quia aeternus.

Death cannot be an evil, being universal (Goethe).

I could not love thee, dear, so much,
Loved I not honour more.

The reasoning here is pointedly compressed. But we can easily supply the missing premiss when, in Beaumont and Fletcher's play, Valentinian says : 'Justice shall never hear you. I am justice.'

This child can't be 'right'. It never does anything wrong.

Carlyle says of Sansculottism : It too came from God; for has it not been?

Mass, thou lov'st plums well that would venture so.
<div align="right">(*Henry VI*, Part II.)</div>

Let us not meet her. Why? They say she's mad.
<div align="right">(*Coriolanus.*)</div>

These hands do lack nobility, that they strike, &c.
<div align="right">(*Antony and Cleop.*)</div>

He is in love. He brushes his hat. (*Much Ado.*)

Pardon it, as you are a gentleman. (*Hamlet.*)

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[1] *Diary of Sir Mountstuart Grant-Duff.* In the republic of Colombia, up to 1903, there have been fifty-four insurrections in forty-seven years.

Forbear to judge; for we are sinners all. (*Henry VI.*)
Sell when you can. You are not for all markets.
                              (*As You Like It.*)
Why dost thou wrong her, that did ne'er wrong thee?
                              (*Taming of the Shrew.*)
Why 'knaves'? Are they not all Athenians?   ·
                              (*Timon of Athens.*)
' Stop thief!' gives conclusion followed by ground. It is quite
ratiocinative.   Thieves ought to be stopped. This man is a thief.
Therefore I call to you to stop him.

§ 893. Some other curtailed reasonings, in which the conclu-
sion comes last, are as follows :—

Cogito, ergo sum. (Descartes.)
He bears the third part of the world.   The third part of the
world, then, is drunk.   (*Antony and Cleop.*)
She is a woman, therefore may be won.
                              (*Titus Andronicus.*)
Because thou art virtuous, shall there be no more cakes and
ale ?   (*Twelfth Night.*)
There's blood upon thy face ! 'Tis Banquo's then.
                              (*Macbeth.*)
The north wind doth blow, and we shall have snow.
It is my son's coat. An evil beast hath devoured him.
The children are so quiet they must be in some mischief.
It is too good to be true (i. e. It, being so good, is not true).
Very often indeed the missing parts of the syllogism are filled
up by action.   A man says, ' Honesty should be rewarded,' and
proffers money. To the first settlers in New England the follow-
ing Sorites, with the final steps and conclusion left to be under-
stood, is attributed :—

' Resolved (1) That the earth is the Lord's and the fulness
thereof. (2) That what is the Lord's is His Saints'. (3) That
we are His Saints.' Ending with the attempt to exterminate
the Indians.[1]

Similarly a whole train of reasoning may be suggested by one
imperative, as *Cherchez la femme*, the 'la' implying a premiss
too well established to need expressing in full.

                              ·

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[1] First they fell upon their knees ;
    And then upon the aborigines.

Example 423

An action may take the place of a premiss, as in the *argumentum ad baculum*.

§ 894. When a general assertion is couched in a conditional form, with a suggestion of the absurdity of the consequent, it is unnecessary to fill up the syllogism. Thus Falstaff protests :—' If I fought not with fifty of them, I am a bunch of radish. If there were not two or three and fifty upon poor old Jack, then am I no two-legged creature.' These are arguments in *Camestres* and *Cesare* respectively.

§ 895. The place of the major premiss is sometimes taken by a maxim or proverb. *'* Rome was not built in a day. You must have patience.' ' If gold rust, what shall iron do ? You must therefore set a good example to your flock.'

§ 896. Similar to this is the Example. ' Had Zimri peace who slew his master ? '

A man might read Wordsworth's *Ode to Duty*, or the life of a saint, and saying, ' Here lies *my* duty,' do it. This would be major, minor, and conclusion.

John Ball's text to the insurgents at Blackheath—

> When Adam dalf and Eve span,
> Who was thanne a gentilman ?—

was itself a compressed syllogism, and the inference, ' There were neither villeins nor gentlefolks in those days,' served as premiss to the preacher's conclusion, ' Good people, things will never go well in England till goods be all in common,' and that as premiss to seizing clubs and billhooks.

§ 897. To build up and complete an imperfect argument, we may start—

(1) From one term only, *S, M* or *P.*

   (a) *S.* What are we to say about it and on what ground ? That *S* is *P*, as being *M.*

   (β) *M.* What results from it ? *S* being *P* results, since *S* is *M.*

   (γ) *P.* Of whom or what can we say this, and why ? Of *S*, which is *M.*

(2) Given two terms only—

   (a) *S* is *P.* On what ground ? On the ground of being *M.* It is *M* and *M* is *P.*

   (β) *S* is *M.* What follows ? That it is *P*, *M* being *P.*

(γ) *M* is *P*. How do you apply this? To the case of *S*, since *S* is an *M*.

(3) Given the minor premiss—

If every *S* is *M*,

Then every *S* is *P*, since every *M* is *P* (*Barbara*).
Or, no *S* is *P*, since no *M* is *P* (*Celarent*).
Or, no *S* is *P*, since no *P* is *M* (*Cesare*).

If some *S*'s are *M*, then

Some *S*'s are *P*, since every *M* is *P* (*Darii*).
Some *S*'s are not *P*, since no *M* is *P* (*Ferio*).
Some *S*'s are not *P*, since no *P* is *M* (*Festino*).

If no *S* is *M*, then

No *S* is *P*, for every *P* is *M* (*Camestres*).

If some *S*'s are not *M*, then

Some *S*'s are not *P*, since every *M* is *P* (*Baroco*).

If every *M* is *S*, then

Some *S*'s are *P*, since every *M* is *P* (*Darapti*).
Some *S*'s are *P*, since some *M*'s are *P* (*Disamis*).
No *S* is *P*, since no *M* is *P* (*Felapton*).
Some *S*'s are not *P*, since some *M*'s are not *P* (*Bocardo*).
Some *S*'s are *P*, since every *P* is *M* (*Bramantip*).
Some *S*'s are *P*, since some *P*'s are *M* (*Dimaris*).
Some *S*'s are not *P*, since no *P* is *M* (*Fesapo*).

If some *M*'s are *S*, then

Some *S*'s are *P*, since every *M* is *P* (*Datisi*).
Some *S*'s are not *P*, since no *M* is *P* (*Ferison*).
Some *S*'s are not *P*, since no *P* is *M* (*Fresison*).

If no *M* is *S*, then

No *S* is *P*, since every *P* is *M* (*Camenes*).

If some *M*'s are not *S*,—no syllogism.

Or if the major premiss only is given, we shall find that—

Every *M* is *P*	suggests	*Barbara, Darii, Darapti, Datisi.*
Some *M*'s are *P*	,,	*Disamis.*
No *M* is *P*	,,	*Celarent, Ferio, Felapton, Ferison.*
Some *M*'s are not *P*	,,	*Bocardo.*
Every *P* is *M*	,,	*Camestres, Baroco, Bramantip, Camenes.*
Some *P*'s are *M*	,,	*Dimaris.*

No *P* is *M*   suggests   *Cesare, Festino, Fesapo, Fresison.*
Some *P*'s are not *M* „   no syllogism.

§ 898. From one premiss and conclusion the other premiss can always be supplied, although, as we have seen, it cannot be proved from the former premiss and conclusion regarded as propositions.   But if we say, It *follows* from *P* not being *M* that no *S* is *P*, we are able to supply the understood premiss, Every *S* is *M*.   Being given that every *S* is *M* and *S* is *P*, we cannot prove that every *M* is *P*; but if every *S* is *M* we can show that ' Every *M* is *P* ' is the only possible premiss which will yield the conclusion Every *S* is *P*.   Indeed in the case of this conclusion (but not of any other), since only *Barbara* concludes in *A*, we can reconstruct the skeleton of both premisses from the conclusion alone.

§ 899. A syllogism, with major premiss understood, is frequently expressed in a single sentence.

Physician, heal thyself.

She, being mortal, of that boy did die.

(*Midsummer N. D.*)

'Αθάνατον ὀργὴν μὴ φύλαττε, θνητὸς ὤν.

Now a participial clause may be represented by an adjective, either qualifying, as

All inspired writings are to be received ;
or descriptive, as

All the inspired Scriptures are to be received.

The former means, 'All writings if inspired,' the latter means, 'All Scriptures because inspired.'   The proposition, 'All the Scriptures of the New Testament are to be received' does not explicitly state its own ground, unless the idea of authority is meant to be conveyed by ' New Testament'.   But ' All inspired writings ' does. It is the difference between an observed fact and a general law ; between ' A postboy never dies', and ' The King never dies', or between ' Black swans are uncommon', and ' Angry swans are dangerous'.

§ 900. Whereas, however, a descriptive adjective or participial clause is really a minor premiss—' The Scriptures are to be received because they are inspired'.   ' Because thou art mortal, thou must not nurse undying resentment'—this is not the case with a *qualifying* adjective or clause.   ' Dead men tell no tales ',

i. e. 'Men, if they are dead, tell no tales' is a simple proposition. It is true it implies 'because they are dead'. But, if we are to construct a syllogism out of this, it cannot take the form—

> Things that are dead tell no tales.
> Men are things that are dead.
> Therefore men tell no tales—

but only,

> Things that are dead tell no tales.
> Dead men are dead things. Therefore, &c.

Such a syllogism would be less unnatural if, instead of 'A dead man tells no tales', we said, 'A dead accomplice.' It would then be—

> Dead men tell no tales.
> A dead accomplice fulfils the condition.
> Therefore he will tell no tales.

The proposition then will be in the form, 'If any S is M it is P' (understood, 'since M is P'). If any coastguardsman be dead he will tell no tales (since the dead tell no tales). Every MS is P.

But where M is *assumed* true of S, the form of the proposition is, 'The MS, or this MS, is P.' More fully, 'S, being M (i. e. because it is M) is P.'

§ 901. The syllogism resting on a double hypothesis cannot be expressed in a simple proposition. 'If S is M and if M is P, S is P' could only become, 'Every PMS is P.' It is good reasoning to argue, 'If life be short, and if what is short be precarious, life is precarious.' But we could not express this as, 'Precarious short life is precarious,' nor can the premisses, 'If a man is mad and if all the mad are dangerous,' be expressed by 'A dangerous madman', which implies two particular propositions, 'Some men are mad'; and 'Some of the mad are dangerous'.

The difficulty of expressing an entire syllogism in a simple, uncomplex, proposition, will appear from the circumstance that the ground, or major premiss, must be universally taken. We cannot say, 'If any S is M and if any M is P, that S will be P'; but only, 'If any S is M and if *every* M is P, that S will be P.' The formula then will not be, 'Every MS is P,' but 'Every MS (M being P) is P'. M being P, whatever S's are M are S's that are P. S may be universal or particular.

§ 902. The formula for the First Figure then will be this, comprising all four moods—

Given that *M* is *P* (*or* not *P*), Every *MS* is *P* (*or* not *P*).

For the Second Figure—

(i) Given that *M* excludes *P* (no *P* is *M*), No *MS* can be *P*.

(ii) Given that *M* includes *P* (Every *P* is *M*), No non-*MS* is *P*.

For the Third Figure—

Given that *M* is *P* (or not *P*), then

Whatever *S* any *M* is is *P*, *or* is not *P*.

But to express this as 'Every *MS* is *P* (or not *P*)' is to confuse the Third with the First Figure. It includes the case of all *S*'s being *M*. This may be materially true, but cannot be formally implied in the premiss, 'Every *M* is *S*,' apart from Hamiltonian theories of quantified predicate.

Disamis and *Bocardo*, having a particular major premiss, permit of no direct attribution of *P* to *S*,[1] and cannot be recognized here. Nor yet *Dimaris* in Fig. IV.

For the Fourth Figure—

(i) Given that *M* includes *P* (all *P* is *M*), then whatever *S* any *M* is includes *P*. It may be some *S*'s, if every *M* is *S* (*Bramantip*), or none, if no *M* is *S* (*Camenes*).

(ii) Given that *M* excludes *P* (no *P* is *M*), then whatever *S* any *M* is is not *P* (*Fesapo, Fresison*).

§ 903. Or the Mood formulas may be more generally expressed thus :—

Figure I.

Barbara. When *S* must be something which must be *P*, *S* must be *P*.

Darii. When *S* may be something which must be *P*, *S* may be *P*.

Celarent. When *S* must be something which cannot be *P*, *S* cannot be *P*.

Ferio. When *S* may be something which cannot be *P*, *S* need not be *P*.

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[1] Why not, I have been asked, if *Disamis* be expressed thus—Given that some *M* is *P*, then, some *S*'s being all the *M*'s, some of them must be *P*? *Bocardo* likewise. But this is equational reasoning, which does not run in the ordinary grooves. 'Some *S*'s' and 'all the *M*'s' are totals.

Figure II.

Cesare.   When S must be something which P cannot be, S cannot be P.

Festino.   When S may be something which P cannot be, S need not be P.

Camestres.   When S cannot be something which P must be, S cannot be P.

Baroco.   When S need not be something which P must be, S need not be P.

Figure III.

Darapti.   When something which must be P must also be S, S may be P.

Datisi.   When something which must be P may also be S, S may be P.

Disamis.   When something which may be P must also be S, S may be P.

Felapton.   When something which cannot be P must also be S, S need not be P.

Ferison.   When something which cannot be P may also be S, S need not be P.

Bocardo.   When something which need not be P must also be S, S need not be P.

Figure IV.

Bramantip.   When something which P must be must be S, S may be P.

Dimaris.   When something which P may be must be S, S may be P.

Camenes.   When something which P must be cannot be S, S cannot be P.

Fesapo.   When something which P cannot be must be S, S need not be P.

Fresison.   When something which P cannot be may be S, S need not be P.

For 'must be' we might say 'is always'.   For 'may be' 'is sometimes'.   For 'cannot be' 'is never'.   For 'need not be' 'is not always '.

§ 904.   Or, more generally still, the formulas might be phrased

thus :—' When anything must be something which must be some third thing, the first thing is always this third thing.' And so forth.

§ 905. If in the above the indifference of the quantity of the minor premiss (which reappears, whatever it is, in the conclusion) seems to be obscured, a general formula for *Barbara-Darii*, &c., would be—'*If any S's are M when M is always P, all such S's are P*'. Substituting not-*P* for *P*, the same formula serves for *Celarent-Ferio*.

§ 906. The ground of a proposition frequently unites subject and predicate in a less direct way than in the simple proposition, '*MS* is *P*.' (If any *S* is *M* it is for that reason *P*.) Instead of being a qualifying adjective or participial clause, it may be a clause absolute or conditional, containing two terms. If *A* is *B*, *C* is *D*. That is *C* (*A* being *B*) is *D*. 'When thieves fall out honest men come by their own.' 'Te duce, milites vincunt.'

§ 907. That is, *C*, under the condition (not of being *M* but) of *M*'s actuality, is *P*. ' *C* (*A* being *B*) is *D*,' may be taken to mean ' *C* (*C* being *A* and *B* being *D*) is *D* '. Yet we cannot identify *honest men* with *rogues* or *fall out* with *come by their own*. The condition here should be regarded as a single term—' *MC* is *D* '. With protasis ' If *A* is *B* ', the apodosis and its syllogistic implication will be—

1. All $\Big\}$ *C* is *D*, implying that All $\Big\}$ *C* is *A*, and All *B* is *D*.
2. Some $\quad$ Some

3. No *C* is *D*, implying that All *C* is *A* and no *B* is *D* (or else that No *C* is *B* and All *D* is *A*).

4. Some *C* is not *D*, implying that Some *C* is *A* and no *B* is *D* (or else that Some *C* is not *B* and All *D* is *A*).

With protasis, 'If Some *A* is *B*,' then—

5. Some *C* is *D* will imply that All *A* is *C* and All *B* is *D*.

6. Some *C* is not *D* will imply that All *A* is *C* and no *B* is *D* (not that No *A* is *C* and All *B* is *D*).

With protasis, 'If No *A* is *B*,' then—

7. All $\Big\}$ *C* is *D*, will imply that All $\Big\}$ *C* is *A* and All not-*B*
8. Some $\quad$ Some is *D*(=All not-*D* is *B*).

9. No *C* is *D*, will imply that All $\Big\}$ *C* is *A*, and No not-*B* is
10. Some *C* is not *D* $\quad$,, $\quad$ Some *D* (=All *D* is *B*).

With protasis, 'If some *A* is not *B*,' then—

11. Some C is D will imply that All A is C and All not-B is D (=All not-D is B).

12. Some C is not D will imply that All A is C and No not-B is D (=All D is B).

§ 908. When either premiss indicates, not hypothetically but categorically, the ground of its assertion, exhibiting in an abbreviated form the way in which it has been arrived at, the syllogism is called an *Epicheirema*. Or both premisses may do this. As Hamilton says, ' There is little or nothing requisite to be stated in this variety of complex syllogism, as it is manifestly nothing more than a regular episyllogism with an abbreviated prosyllogism interwoven.' [1]

B is A.

C, being D (i. e. because it is D, not, if it is D), is B.
  Therefore C is A.

All vice is odious.

But avarice is a vice, for it is enslaving.

Therefore avarice is odious. [2]

But the auxiliary reason may be attached to either major or minor premiss, or both.   More fully—

M is P, for it (M) is D.
S is M for it (S) is G.
Therefore S is P.

The reason thus rendered for the premiss is merely parenthetical, and does not affect the syllogism.   It is explicative, not conditional.

The reason may be simply an assertive adjective, epithet, or participle, as

The winner will get the prize.
Lucky William is sure to win.
Therefore William is sure to get the prize.

[1] *Lectures on Logic*, i. 365.

[2] The illustration given by Veitch (*Institutes of Logic*, p. 444)—

' It is permissible to take the life of a man who lays an ambush for the purpose of taking yours.

' Milo, therefore, was justified in killing Clodius, for Clodius had laid an ambush against Milo's life '—

is not an Epicheirema as it stands, but merely major premiss, conclusion, minor premiss.   It should be expressed thus—

Whoever kills a waylayer is justified.
Milo killed a waylayer, for he killed Clodius.
Therefore Milo was justified.

Ships which cannot pass the bar must wait outside.

The enormous (or heavily-laden) troopships cannot pass it.

It follows that the troopships must wait outside.

'Lucky' means because he is lucky. 'Enormous' or 'heavily-laden' in the same way alleges an assumed fact as the reason. But if 'the heavily-laden troopships' meant those troopships which are heavily laden (implying that some are and some are not), the reason would no longer be stated assertorily but hypothetically, and there would be no epicheirema. The minor term in the conclusion could not be simply 'the troopships', but must be 'the heavily-laden troopships'. It is the difference between 'A soft answer turneth away wrath' and 'Her soft answers turn away wrath'—, an answer *if* soft, and her answer *because* soft. Thus there is nothing recondite about epicheirematic arguments.

CHAPTER XXVII

CONDITIONAL REASONING

§ 909. THE connexion of subjects has now brought us back to Conditional Reasoning, the simplest form of which is—

If X is Y it is Z.

X is Y. Therefore X is Z.

Conditional arguments are subdivided into (i) conjunctive, or simply hypothetical, (ii) disjunctive, (iii) dilemmatic. In deference to Sir William Hamilton's great learning Conditional is here regarded as genus and Hypothetical as species. But, as he notes, *conditionalis* is the usual Latin translation of ὑποθετικός,[1] and the point is not a material one.

A syllogism is called Conditional not because the conclusion, like all conclusions, is conditionally true, but because the major premiss or sumption is explicated in the form of a conditional statement, while the minor premiss takes the form of an assertion that the condition is realized.

§ 910. It is plain that such a syllogism does not differ in principle from the ordinary categorical syllogism of the form—

Every MS is P ($=$ If any S is M it is P).

This (S) is an MS ($=$ this is a case of S being M).

Therefore this (S) is P.

Hard words break no bones. This (word) is a hard word. Therefore it breaks no bones.

§ 911. The 'conditional' syllogism, however, is ordinarily one in which the sumption cannot be expressed in the form, 'Every MS is P,' owing to S being an individual object or concrete class, and in which the subsumption, instead of bringing under MS as middle term some as yet unspecified minor term X ('Every X is MS', or 'Some X's are MS'), asserts that S, the concrete S, is M.

§ 912. So that the conditional syllogism which seems at the

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[1] *Lectures on Logic*, i. 236.

first glance to have five terms—If A is B, C is D; such and such is a case of A being B; then such and such is a case of C being D—might in a sense be said to have only two, the minor term being represented by *This*, or the idea of assertion.

> If S be M it is P.
>> S is M.   Therefore S is P.
> If MS then P (MS involves P).
>> The case of MS is a real one.
>> Therefore P.

> If the grass is wet it will give you damp feet.
> The grass is wet.   Therefore, &c.

'If the grass is wet' here means, 'If the lawn, or some speci-fied piece of grass, is now, or at some particular time, wet.' But were we to say, 'If the grass is wet it is easier to cut,' the proposi-tion would be more general. It could be expressed thus, 'Wet grass is easier to cut.' But not the former proposition. Yet in both propositions there is condition and conditioned. Only, whereas the abstract principle *may be* expressed in full conditional form, the concrete connexion *must* be so expressed.

§ 913. It is surely in quite another sense, then, that Bosanquet remarks: 'The Universal Judgement, when pushed to the ex-treme point of abstraction, becomes the Hypothetical Judge-ment.'[1] He contrasts the abstract, as 'the thought of an ideally isolated attribute', with 'the thought of a self-dependent and self-related individual'.

The abstract 'does not refer to a concrete subject, . . . and consequently we do not consider whether its subject is given in actuality or not, for it is essentially the judgement of necessity or relativity in which the subject is taken, not given, and taken not for its own sake but for the sake of that which is to follow from it'.

But it is precisely the concrete and actually-given about which no general statement can be framed except in explicit hypothetical form. 'If John is hungry he must have his supper' can only be expressed by protasis and apodosis. 'Hungry John must have his supper' would mean '*because* he is hungry'. 'A hungry John', &c. would be a more abstract proposition than was in-tended. On the other hand Bosanquet admits that between the hypothetical judgement and the abstract statement of a rule

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[1] *Logic*, i. 249.

the difference is 'grammatical rather than logical'. The hypothetical judgement ' is found whenever we frame assertions about an abstract content', and can then 'be expressed without a conditional sentence at all '.[1] As he says :—'All hypothetical judgement rests on a categorical basis. That is to say, all relativity rests on an absolute *datum*, and all necessity on fact.'[2] The consequence in a conditional proposition has necessarily a universal character.   In 'Were the whole realm of nature mine', &c., or 'If they were all one member, where were the body?', the universality does not lie in ' whole ' or ' all ', but in the 'if' followed by the assertion of consecution. And an arithmetical problem of the form, 'If five men worked a piece of ground in fifteen days, and each day had ten working hours, then,' &c., is just as universal as the above, and a necessary judgement as well. Apart from any sign of conjunction, 'The whole realm of nature is mine' is a concrete proposition. To become general it requires an *if* or *suppose*, the grammatical indications of consecution.   Or, ' *The case of* all the sea being ink would be (or is) *the case of* our having nothing to quench thirst.'

§ 914. The major premiss of the Conditional Syllogism being thus a supposition, usually, about a concrete individual or aggregate, the minor premiss, or subsumption, is necessarily an assertion that the supposition is realized.   The true subject, or minor term, is actual Reality. ' If this rope is frayed it is dangerous.   It is frayed.'   Reality is actually qualified in the supposed way.   But to ' Frayed ropes (i. e. If ropes are frayed they) are dangerous ' we cannot put the minor premiss, ' It is so.   They *are* frayed.'   But we must say, 'It is so in this case, or in such and such a case '—introducing a new minor term.

§ 915. Hamilton[3] adopts the following paragraphs from Krug's *Logik* :—

'This consequence (*if is—then is*) is the copula in hypothetical propositions ; for through it the concepts are brought together, so as to make up, in consciousness, but a single act of thought ; consequently, in it lies that synthesis, that connexion, which constitutes the hypothetical judgement. Although, therefore, an hypothetical judgement may appear double, and may be cut into two different judgements, it is nevertheless not a composite judgement. For it is realized through a simple act of thought, in which *if* and *then*, the

[1] *Logic*, i. p. 252.   [2] Ibid. p. 256.   [3] *Lectures on Logic*, i. 238, 239.

antecedent and consequent, are thought at once, and as inseparable. The proposition, *If B is, then A is*, is tantamount to the proposition *A is through B*. But this is as simple an act as if we categorically judged *B is A*, that is *B is under A*. Of these two, neither the one—*If the sun shines*, nor the other—*then it is day*, if thought apart from the other, will constitute a judgement, but only the two in conjunction. But if we think—*The sun shines, and it is day*, each by itself, then the whole connexion between the two thoughts is abolished, and we have nothing more than two isolated categorical judgements. The relatives *if* and *then*, in which the logical synthesis lies, constitute thus an act one and indivisible.'

§ 916. What follows, however, confuses the ontological standpoint with the logical :—

' For the same reason an Hypothetical judgement cannot be converted into a Categorical. For the thought, *A is through B*, is wholly different from the thought *A is in B*. The judgement —*If God is righteous, then will the wicked be punished*, and the judgement—*A righteous God punishes the wicked*, are very different, although the matter of thought is the same. In the former judgement, *the punishment of the wicked* is viewed as a consequent of *the righteousness of God*; whereas the latter considers it as an attribute of *a righteous God*. But as the consequent is regarded as something dependent from,—the attribute, on the contrary, as something inhering in,—it is from two wholly different points of view that the two judgements are formed. The hypothetical judgement, therefore, *A is through B*, is essentially different from the categorical judgement, *A is in B*; and the two judgements are regulated by different fundamental laws. For the Categorical judgement, as expressive of the relation of subject and attribute, is determined by the laws of Identity and Contradiction ; the Hypothetical, as expressive of the relation of Reason and Consequent, is regulated by the principle of that name.'

§ 917. This distinction between consequence and attribution is wholly extra-logical. ' Rainy weather will be bad for the review.' ' If the weather is rainy it will be bad weather for the review.' Are these two propositions governed ' by different fundamental laws ' ? Possibly, however, Krug distinguishes between *If God is righteous then will the wicked be punished* and *If God is righteous, then will He punish the wicked*, intending the latter proposition not as a general statement but as applying to certain specified wicked people. The difference in this case will be the one between ' Rainy weather is bad for regattas ' and

'Rainy weather will be bad for our regatta.' Looking to the expression, it is the difference between ' If A is B, it is C' and ' If A is B, C is D'. Excessive rain is damaging to the crops. If rain is excessive, the crops are damaged, or, our crops will be damaged. Logically, however, the proposition, 'BA is DC,' means, If A is B, C is D, the distinction between subject and attribute on the one hand and reason and consequent on the other being immaterial to the logician, and superficial even for the metaphysician.[1]

§ 918. Bosanquet says that Conditional reasoning is usually stated in one of three forms in 'the traditional logic'—If A is, B is.—If A is B, then C is D.—If A is B, it is C. 'The third is the form which guides us to the true import of the judgement,' although the second is most commonly in use, ' conformably to the habitual irrelevancy of popular thought.' 'If A is B, C is D,' is 'a broken-backed sequence in which no point of unity is formally recognized between the antecedent and the consequent'; though, he allows, when significant words are substituted for letters the unity would generally be obvious—' but in such a case the expression is not essentially distinguishable from the third form.'[2] But ' where no rational nexus is traceable, but only a coincidence in fact, however general, we cannot admit that the essentials of hypothetical judgement are present'.[3] It is surely impossible to assert one phenomenon to be invariably and necessarily coincident with another without implying some abstract relation of cause, whether understood or not. Most weather maxims are of this kind. Even superstitions like a harelip meaning luck, or a magpie portending a marriage, are referred to some real though unknown cause. ' With that forehead he is sure to be hanged ' cannot be distinguished from

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[1] Veitch observes that the *nexus* between antecedent and consequent may be a relation either (1) of whole and part, or (2) of cause and effect, or (3) of sign and thing signified, or (4) of genus and species, or (5) of mark of a mark. ' But the connexion is only of one kind for the logician. It is given as that of condition and conditioned, determining and determined. The formula really is: *Think this and you must think that*' (*Institutes*, p. 502). A proposition like Horace's, ' non, si male nunc, et olim Sic erit,' denies the connexion, the universal. It is analogous to ' neque semper arcum Tendit Apollo '. Antecedence, of course, is understood in a logical, not a temporal or spatial, sense.

[2] *Logic*, p. 251.   [3] Ibid. p. 254.

'With that mole on his neck he is sure to be drowned', though in the one case the connexion is less mysterious than in the other. No doubt we sometimes, half in jest, speak of two phenomena as inseparable where no causal connexion is really believed in. 'I never meet B, but I hear afterwards of a death in his family.' 'When I sit in this chair I always win.' But even if this be stated as a mere coincidence, all that is required logically to make a proposition conditional is an affirmation of antecedence and consequence. There need not indeed be anything general about the form of the proposition. 'If he said that, he said something unusually foolish. He did say it. Then,' &c. 'Suppose I miss the 9.40 train I shall come by the 11.5. You are sure to miss it. Then I am sure to come by the 11.5.'

There is, of course, a relation of cause and effect between missing the one train and coming by the other. But it is, no doubt, judgements of this kind to which Bosanquet too hastily refuses the name of hypothetical.

§ 919. The conjunctive particle may be *when* or *where*. ' Ubi desinit medicus incipit Dominus.' But the logical *nexus* is the same. ' *When* in doubt trump about.' But in ' *When* all is so doubtful I can take no step' the conjunction is causal. ' Better a dinner of herbs *where* love is than a stalled ox and hatred therewith.' *Where* is less local here than in ' Where the bee sucks there suck I ', or in ' ubi episcopus, ibi ecclesia ', or in ' Whither thou goest I will go '. From different points of view these conjunctions express the universality of the coexistence of two states or events—either an empirical universality or one abstract and general. But, remarks Sigwart, ' we cannot state that two events will happen together in the future, nor that they will always and unconditionally take place together, unless there is some necessary connexion between them. To this extent, therefore, the meaning of what was originally no more than a temporal particle (*when*) comes to include this necessary connexion, and thus to serve as the conditional conjunction in the hypothetical judgement. *Where* in its general significance passes through the same process.' [1]

Antecedent and consequent are frequently merely coupled together by *and*. ' Spare the rod and spoil the child.' ' Ask no

[1] *Logic*, i. 218.

questions and you will hear no lies.' Or merely juxtaposed.
'Love me, love my dog.' 'Aide-toi, Dieu t'aidera.' 'Fay bien,
crains rien.' In 'Seek and ye shall find', 'Give him an inch and
he will take an ell,' 'crede et manducasti,' and similar sentences,
the protasis is an imperative and the apodosis a judgement about
what will result if the command is obeyed. So, 'accedat verbum
et fit elementum.' But there might be an imperative in the
apodosis alone; as 'si vis pacem para bellum'. Gnomic
wisdom, of course, aims at extreme brevity. 'Down corn, up
horn' means that what is bad for arable is often good for pasture.
'Festina lente' may be expanded into 'If you go slowly you are
more likely to get ahead quickly'.

As for 'If A is B, C is D' being a 'broken-backed sequence',
this is merely to say that the sequence is synthetic and not
analytic—a consequence, as Mansel says (*Prolegomena Logica*,
pp. 213, 214), necessitated by laws other than those of thought.
Any synthetic abstract judgement whatever might similarly be
called broken-backed, as asserting a material rather than a
conceptual consequence.

§ 920. Boole holds that 'If A is B, C is D' implies *time*, and
is not 'All cases of A being B are cases of C being D'. His
'1' then, or Unity, in what he calls secondary propositions,
stands not for the universe of events but for 'the eternity in
whose successive moments they are evolved'. The idea of
space, as though identity meant coextensiveness, is not neces-
sary either for secondary or for primary propositions. The
laws of combination of the literal symbols are in both cases, he
says, the same, the only difference being one of interpretation.[1]

§ 921. The logician, however, can leave such metaphysical or
grammatical questions on one side. He is not concerned with
the form of hypothesis and thesis, asking only whether there is
an assertion of antecedence and consequence. Whether the
connexion be one of inherence of quality in substance, or of
effect produced by a cause, or of simple coexistence and co-
incidence, does not affect the logical character of a conditional
proposition, which depends not on substantive equivalence or
temporal and spatial coincidence but on conjunctive assertion.
And 'all categorical judgements which are unconditionally
universal are exactly equivalent in meaning to hypothetical

[1] Op. cit. p. 176.

judgements'.[1] Moreover, since 'all' is ambiguous, and may introduce either a judgement which is empirically universal, or one which is unconditionally universal, general statements are more adequately expressed in the hypothetical form. Even an empirical universal may be stated in hypothetical form. 'All the Apostles except Iscariot were Galileans' (a fact), or 'were inspired' (causal relation). If any one was of the number of the Apostles—Judas Iscariot apart—he was a Galilean, or was inspired. The question, e. g., might arise about St. James the Just. 'All the summer months here are free from frost.' If any month is a summer month it is free from frost. But there might be uncertainty as to whether May and September were included.

§ 922. Hamilton himself observes :—

' In point of fact, logically or formally, the law of Identity, and the law of Reason and Consequent in its affirmative form, are at bottom the same ; the law of Identity constitutes only the law of Reason and Consequent—the two relatives being conceived simultaneously, that is, as subject and predicate; the law of Reason and Consequent constitutes only the law of Identity, the two relatives being conceived in sequence, that is, as antecedent and consequent. And as the law of Reason and Consequent, in its positive form, is only that of Identity in movement ; so, in its negative form, it is only that of Contradiction in movement.'[2]

§ 923. Again :—

'Inasmuch as a notion is thought, it is thought either as existing or as non-existing, and it cannot be thought as existing unless it be thought to exist in this or that mode of being, which, consequently, affords it a ground, condition, or reason of existence. This is merely the law of Reason and Consequent; and the hypothetical is only the limitation of a supposed notion to a certain mode of being, by which, if posited, its existence is affirmed ; if sublated, its existence is denied.'[3]

§ 924. Either, however, the last words are a slip,—for the sublation of the antecedent is not the denial of the consequent,— or Hamilton is here assuming his doctrine of equational predication. An equation, however, cannot be represented as a relation of Reason and Consequent. It is true that a condition may be a

[1] Sigwart, i. p. 224.   [2] *Lectures on Logic*, i. 354.
[3] Ibid. ii. p. 377.

conditio sine qua non.[1]   Only if *A* is *B* can *C* be *D*.   But then, strictly taken, this fails to assert that, if *A* is *B*, *C* always is *D*. The proposition is rather, 'Every *DC* is *BA*' (Every case of *C* being *D* involves the case, supposition, or condition, of *A* being *B*), than 'Every *BA* is *DC*'. 'Only if' is the force of *si* in Horace's—

> Si pugnat extricata densis
> Cerva plagis, erit ille fortis
> Qui perfidis se credidit hostibus (iii. 5).

Also of sentences such as ' When rivers run upward to their fount, then will I forget thee '.

§ 925. Elsewhere Hamilton explicitly applies his equational doctrine to hypothetical propositions.   He says :—

'The interdependent propositions are erroneously called Antecedent and Consequent. Either is antecedent, either is consequent, as we choose to make them.   Neither is absolutely so.   This error arose from not expressing overtly the quantity of the subject of the second proposition.'[2]

§ 926. His general Canon for Hypotheticals is this :—

'Two or more propositions thought as indetermined in quality, but as in quality mutually dependent, the determination of quality in the one infers a determination of the corresponding quality in the other.'[3]

§ 927. The ancient logicians, including Aristotle, were content

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[1] ' The *requisite* or *condition* is that without which the phenomenon never is ; the *cause*, on the other hand, is that through which it always is ' (Esser, quoted by Hamilton, ii. 159). Sigwart urges that the ordinary sense of condition is necessary condition. ' The view that the hypothetical judgement states the consequent as *necessary consequence* of the antecedent seems contrary to the way in which logic and grammar generally speak of the antecedent as *pre-supposition* or condition of the consequent. For if we understand condition in its ordinary sense as meaning the *conditio sine qua non*, as that which must be realized before something else happens or is valid, then it seems to imply that the negation of the antecedent involves that of the consequent, and that the consequent ceases to be valid when the antecedent is not true. But this is just what necessary consequence does not involve.   The consequence may be there even when the ground is wanting, unless indeed it is the sole ground, and all agree that the invalidity of the antecedent does not involve that of the consequent ' (*Logic*, i. 383, 384).   There is certainly some ambiguity about the words *condition* and *pre-supposition*, which does not attach to *antecedent*.   Yet a supposition must be a presupposition, and 'granted that' is conditional.

[2] Op. cit. ii. 375.   [3] Ibid. p. 374.

to set forth the law of Reason and Consequent without recognizing Hypothetical Syllogisms as a separate class.[1] Such forms are more necessary to some languages than others, the distinction being one of syntax rather than of philosophy. From a psychological point of view these forms, Hamilton remarks,

'are not argumentations, but preparations (explications) for argumentation. They do not settle the *quaesitum*, they only put the question in the state required for the syllogistic process . . . E. g. let the problem be, *Does animal exist?* This question is thus hypothetically prepared—*If man is, animal is.* But [as is conceded] *man is ; therefore animal is.*'[2]

§ 928. In other words, we look about for some possible ground or cause for a phenomenon Y, of whose reality we are uncertain. We observe that X is such a ground or cause. If X, then Y. X will involve Y. But is X a *vera causa*? Has it reality? The minor premiss asserts that it has. Then Y has reality. Or regarded from the other end—What is the outcome, the consequence, of the existing situation? If the existing situation were X the consequence would be Y. But it is X. Then expect Y.

§ 929. Sigwart observes :—

' Reflexion concerning the value and significance of hypotheses is always necessary where we cannot form a definite judgement, but must endeavour to arrive at truth by way of a preliminary experiment. Thus hypothetical and disjunctive judgements rank with the negation, which, like them, is a *judgement concerning a tentative judgement.* They both apply to that stage of thought which lies between the question and decision.'[3]

Again :—

'The consequent is not to be stated till the antecedent has been confirmed. A conditional proposition is therefore an expression of uncertainty with reference to both antecedent and

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[1] 'The omission of hypothetical syllogisms has frequently been blamed as a defect in Aristotle's Organon ; and his French translator takes some fruitless pains to strain his text, in order to make out that he does in fact treat of them. . . . Aristotle understood the limits of logic better than his critics ; and his translator had better have allowed the omission as a merit than have attempted to deny it as a fault ' (Mansel, *Prolegomena Logica,* p. 215, and *Aldrich,* p. 235). On the meaning of συλλογισμὸς ἐξ ὑποθέσεως in Aristotle see Mansel's *Aldrich,* Note I. Aristotle opposes Hypothetical not to Categorical but to Ostensive (δεικτικός).

[2] Op. cit. ii. 376, 377.　　　　　　　　　　　[3] *Logic,* i. 219.

consequent. Both are problematically stated, or, as we should
say, express mere hypotheses. So far as concerns the two
propositions themselves, therefore, there seems to be no judge-
ment at all in the proper sense, no utterance, that is, which is
stated as true and necessary. And this view is confirmed by
the fact that conditional propositions are sometimes stated with
the avowed consciousness of the falsity of both antecedent and
consequent (*si tacuisses, philosophus mansisses*).[1] Nevertheless
such a combination of propositions does contain a statement
which is a judgement in the proper sense of the word, and this
the Stoics were the first to recognize definitely. Such a com-
bination tells us that antecedent and consequent are related to
each other as ground and consequence, that to accept the
antecedent makes it necessary to accept the consequent. It is
this relation of necessary consequence which is the true predicate
of the hypothetical judgement.'[2]

§ 930. In the fully deployed hypothetical judgement the terms
of the major premiss are the constituent propositions. 'BA is
always DC' is explicated in the form, 'The supposition of A being
B is always the supposition of C being D.' Yet this can be
stated in the form—C, when A is B, is always D. The conclusion
moreover is, C is D. It might seem, therefore, that C and D are
minor and major terms respectively, the middle term being the
proposition, A is B. And yet that involves the anomaly that
the minor term is found in the major premiss. The seeming
difficulty really lies in the subsumption. It is this and not the
major premiss which differentiates the 'hypothetical' form of
syllogism from the 'categorical'. The former is really a cate-
gorical syllogism in the form, not 'M is P, S is M, S is P', but—

Every MS is a PS (= If any S is M that S is P).

But Every S is an MS; or, This S is an MS (This is a case
of MS). In the above syllogism, C is an (A is B) C.

Therefore Every S is a PS; or, This S is a PS (This is
a case of PS).

In such a syllogism the minor term S appears in the major

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[1] The falsity of the consequent, carrying with it the falsity of the
antecedent, is suggested by the pluperfect subjunctive (Greek ἄν with
indicative). 'If it was an adversary that had done this thing I could have
borne it'—implying that it could not be borne, and therefore it was not
an enemy that did it. 'I will not come (Y) unless (or until) you write
(X)' is of the form, 'If not X then not Y.' 'I shall not write' affirms the
antecedent, involving the affirmation of the consequent, 'I will not come.'

[2] Op. cit. p. 220.

premiss, but not as the *ground* of the predicate *P*, which is *M*; or rather, *S* when qualified as *M* is the ground of *S* being qualified as *P*.

Again—

Every *BA* is *DC* (= If in any case *A* is *B*, in that case *C* is *D*). But every *A* is a *BA* (= In all cases *A* is *B*), *or*, This *A* is a *BA* (= In this case *A* is *B*). Then every, or this, *A* is *DC* (= In all cases, *or* in this case, the phenomenon *A* is attended by the phenomenon of *C* being *D*). *A*, *B*, *C* and *D* are not really a *quaternio terminorum*.

Should the hypothesis take the common form, 'If (in this case) *A* is *B* then (in this case) *C* is *D*,' this should still be represented categorically by the general principle, Every *BA* is *DC*—that is, All supposition of *BA* involves *DC*. *If A is B* means, *If A prove to be B*. The thesis also is still 'This *A* is *BA*'—this is so; it is as you suppose; the case taken is real.

§ 931. Inference in the hypothetical syllogism is, like all inference, mediate—from 'This diamond, if real, is valuable' we can neither infer that it is real nor that it is valuable[1]—but

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[1] Veitch thinks that Hamilton's 'final view' (i.e. after 1850) about Conditional Reasoning is that 'there is no reaching a conclusion through a middle term. There is thus no mediate inference, or reasoning syllogistically. The so-called major premiss is not properly a major premiss. There is but one premiss, and all that it does is to state a relation or dependence between the judgements or propositions. You have but to apply the rule of the Condition and Conditioned. We do not need to go beyond the given relation or dependence; we do not need another term or proposition, in addition. We have only to apply the rule of inference to what we have—in a word, the inference is immediate. And it belongs to what may be called Explicative Inference' (*Institutes*, p. 498). Indeed, a darkening of counsel! How can an assertion of actuality be *immediately* drawn from a conditional assertion, from an assertion about a relation, terms of fact from terms of concept—'*C* is *D* because *A* is *B*' from '*C* is *D* if *A* is *B*'; 'This is *Y*' from 'Every *X* is *Y*'? Veitch well remarks that 'Hamilton cannot be said to have reached a conclusion wholly definite, clear, or satisfactory' (ibid. p. 368). 'Explication of what is conditional can only state the condition in a particular form' (ibid. p. 499). On the other hand, 'If' with an optative or pluperfect indicative usually expresses something more than a doubt. 'If he were wise he would go'—'If he had been wise he would have gone.' We can infer that he is not going or has not gone from the implied assertion of his unwisdom. 'Perierat totum quod Deus fecerat nisi misericordia subvenisset.' 'Werena my heart licht I wad dee.'

the mediation instead of being simply M, i. e. if anything is M, is MS, i. e. if any S is M.[1]

§ 932. The Law of Persistency governs the illative process. Given the abstract principle that MS is PS, or that BA is DC, then it holds in this concrete case of S being M, or of A being B.

[1] It must be confessed that there is some array of authority for the view that conditional inference is immediate—Boole (who says that the hypothetical syllogism need contain no more than two terms), De Morgan, Bain, and others. Such a view, however, is based upon 'if' concessive (= even if), not 'if' conditional. '*If* his temper is hot it soon subsides.' In thought, though not in form, the condition is conceded as true. The sentence is equivalent to—'His hot temper soon subsides' —i. e. 'his temper, though hot,' 'his temper (which I grant is hot),' a concrete not an abstract judgement. The condition then might be omitted, and we might assert at once, 'His temper soon subsides.' But then there is no inference here at all, whether mediate or 'immediate'. Bain, in fact, says 'There is no inference in this case. Accepting "*A* is B" we accept "C is D"; this is another expression for the same fact.' But 'accepting' here should mean 'because we accept', not 'if we accept'. He goes on, however,—' " If the weather continues fine we shall go into the country " is transformable into the equivalent form, "The weather continues fine, and we shall go into the country" ' (*Logic*, i. 117). This I do not follow. The late Professor Croom Robertson (*Mind*, ii. 264, ' *The Logic of "If"* ') quotes a passage from *Clarissa Harlowe*, where Morden says : 'Had you heard me out, Mr. Lovelace, you would have found that my *if* was an *if* of inference rather than of doubt.' I prefer to say 'an *if* of concession'. All conditional statements suggest an inference. Concessive 'if' is seen in such phrases as—' Si la foi est immobile, la science ne l'est pas '.(D'Hulst) ; ' If I am not an Apostle unto others, yet doubtless I am to you'; 'Gin a body meet a body, need a body cry?' ('If' = 'given that', = here 'granted that'.) The apodosis is usually negative—'It does not follow that'. ' Non, si Opimium defendisti, idcirco te isti bonum civem putabunt' (Cicero. This is really an O proposition). Again, 'si omnes, ego non.' 'If' is not always expressed ; e. g. ' merses profundo, pulchrior evenit.' The conjunctive mood sometimes imports a condition—' unum cognoris, omnes noris ' (Ter.) ; ' Use every man after his desert and who would scape whipping ?'— sometimes a concession—' naturam expellas furca tamen usque recurret '; ' Be thou as chaste as ice, as pure as snow, thou shalt not escape calumny'; 'Come what come may, Time and the hour run through the roughest day.' Cf. the French *soit*. For the double sense of 'if' (*ἐάν*) see I Cor. xiii. 1–3, ' If I speak with the tongues of men and of angels,' &c. Sometimes conditional 'if' implies an *a fortiori* argument—'If gold rust, what then shall iron do ?' The protasis is sometimes put interrogatively —'negat quis? nego. Ait? aio' (Ter.). In 'si vis amari, ama' (Seneca) the apodosis 'ama' seems to be the condition, viz. of being loved. But it cannot be the condition of ' si vis amari '. In full, ' Whatever desire you have to be loved carries with it the duty of loving.'

Granted the general supposition that when S is M it is P, or that when A is B C is D, then that applies to the case before us, in which S is M, or A is B.

§ 933. Similarly the sublation of the predicate, or consequent, involves the denial of the subject, or antecedent.

If S is M it is P. It is not P. Then it is not M.

If A is B, C is D. C is not D. Then A is not B.

Such denial of the consequent is styled the *Modus tollens*, as the affirmation of the antecedent is named the *Modus ponens*.

§ 934. It makes no difference whether antecedent and consequent are, as propositions, affirmative or negative. The consecution, the inter-dependence, is always asserted. So that the following are varieties of the *Modus ponens* :—

(1) If A is B, C is D. A is B. Then C is D.

(2) If A is not B, C is D. A is not B. Then C is D.

(3) If A is B, C is not D. A is B. Then C is not D.

(4) If A is not B, C is not D. A is not B. Then C is not D.

The above *in modo tollente* will be as follows :—

(1) If A is B, C is D. C is not D. Then A is not B.

(2) If A is not B, C is D. C is not D. Then A is B.

(3) If A is B, C is not D. C is D. Then A is not B.

(4) If A is not B, C is not D. C is D. Then A is B.

Such a proposition as, e. g., (4) would stand categorically as 'Every non-BA is a non-DC'.

Lord Falkland said : 'When it is not necessary to change, it is necessary not to change.' The symbolic form of this proposition would be, Every non-BA is a B non-A. If change is not necessary, not-to-change is necessary. 'Ce qui ne vaut pas la peine d'être dit on le chante' (the Opera). This is 'Every non-BA is C.'

§ 935. A negative antecedent or consequent (If A is untrue B is untrue) must not be confused with the negation of antecedent or consequent. If we say, 'When A is B C is not D. But C is not D,' we have affirmed, not denied the consequent, and having done so we can neither infer that A is B nor that it is not B. To deny the consequent we must say, C *is* D. As Sigwart says :—

'Passing to hypothetical judgements concerning negations, we find that the form, 'If X is, Y is not,' represents the negation of

a proposition as the necessary consequence of an affirmation, thus affirming that the hypotheses X and Y are incompatible. The relation is always mutual. If the negation of Y necessarily follows from the affirmation of X, then (according to the law of ground and consequence) the negation of X follows necessarily from the affirmation (i. e. the denial of the negation) of Y. To such a hypothetical judgement there corresponds the categorical judgement which is universal and negative. The proposition 'No right-angled triangle is equilateral' makes the same statement as the proposition 'If a triangle is right-angled, it is not equilateral; the negation of the predicate equilateral is stated as the necessary consequence of the determination right-angled.'[1]

§ 936. But it must be by a confusion of thought that Sigwart maintains that 'No right-angled triangle is equilateral' is negative, while 'If a triangle is right-angled it is not equilateral' is affirmative. In the latter, he seems to say, we affirm a negative proposition as a necessary consequence. Surely in every proposition, affirmative or negative, we affirm the predicate as a necessary consequence of the subject. (I assume that, in the illustration given, the *material* or mathematical necessity of the consequence, as a 'synthetic judgement *a priori*', may be left out of account: we are only dealing with formal and logical relations.) Of course all predication is, in a sense, an affirmation. But in denial we affirm an incompatibility. To use Sigwart's words, 'The determinations contained in the thought of X necessitate the negation of Y.' 'This,' he adds, 'which is the meaning of a universal negation, the hypothetical judgement expresses by affirmation of this necessity.'[2] But why does it do this more than a categorical negation? 'No X is Y' is the same statement logically as 'Every X is not-Y', which, in full hypothetical explication, becomes, 'If anything is X it is not Y.' In such a proposition the antecedent and consequent are not X and Y (the being X and the being Y), but X and not-Y (the being X and the not being Y).

§ 937. A hypothetical judgement is not more a negative judgement if it is phrased, 'No case of A being B is a case of C being

[1] *Logic*, i. 226.

[2] Veitch says: 'In the Hypothetical Syllogism the major or Sumption is always definite in quantity and affirmative in quality; the Subsumption may vary in these respects. . . . It should be explained that affirmative [here] means simply the assertion of dependence between antecedent and consequent' (*Institutes*, pp. 493, 494).

D,' than if it is phrased, 'If A is B, then C is not D.' We call the latter a negative proposition because we assert the incompatibility of C and D in the case of A being B.

§ 938. A categorical universal judgement is denied by a particular judgement, and vice versa. It is the same with hypotheticals. Thus we deny—

(A) If A is B C is always D, by (O), Sometimes if A is B C is not D.

(I) If A is B C is sometimes D, by (E), If A is B C is never D.

(E) If A is B C is never D, by (I), If A is B C is sometimes D.

(O) If A is B sometimes C is not D, by (A), If A is B, C is always D.

§ 939. A hypothetical judgement, in other words, like a categorical, is contradicted by denying the consequence, the necessity of the connexion. 'If A is B, C is D' is not contradicted by 'If A is B, C is not D' (this is its contrary), but by 'When A is B C need not be D'. Similarly, to deny the *consequent* is not to deny the *consequence*. 'C is not D' does not deny that, if A were B, C would be D.

§ 940. A hypothetical judgement can be particular in exactly the same way as a categorical. The connexion between antecedent and consequent is affirmed or denied not as objectively necessary or invariable, but as possible or occasional. Some C's, when A is B, are D, *or* are not D. Regarded, however, subjectively and logically, the particularity is not a modification of the consequence (which answers to the categorical copula), but is part of the consequent.[1] A being B it follows that C is

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[1] 'The true character of hypothetical reasoning is lost sight of in the examples commonly selected by logicians, which have for their subject a *proper name*, and indicate, not a general relation of reason and consequent between two notions, but certain accidental circumstances in the history of an individual. The adoption of this type has led to the logical anomaly that the propositions of a hypothetical syllogism are generally stated without any designate quantity' (Mansel, *Proleg. Logica*, p. 216). We have seen, however, that an abstract proposition about a concrete existence *requires* to be stated in hypothetical form. A relation between two individual facts, moreover, leading to a singular conclusion, may be asserted or denied as occasional. 'If John is the driver I feel safe. John is usually the driver. I therefore usually feel safe.' Or again, 'If John drives, an accident is possible (accidents sometimes occur). John is now

sometimes *D*. Deny the consequent—It is untrue that *C* is sometimes *D*; it is never *D*—and the supposition *necessarily* falls to the ground—*A* is not *B*. Affirm this supposition—*A* is *B*,—and the consequent is *necessarily* true, viz. that *C* is sometimes *D*. The consequence is peremptory, though the consequent be in itself, as a proposition, uncertain or particular.

§ 941. The positing of the antecedent is called by the Schoolmen the return (ἡ ἐπάνοδος) upon the prior. The sublation (ἀναίρεσις) of the consequent is called the return upon the posterior.[1]

§ 942. But the positing or sublation contained in the minor premiss may be itself conditional. We saw this in treating of Sorites. *F* is if *E* is. *E* is if *D* is. *D* is if *C* is. *C* is if *B* is. *B* is if *A* is. Now to assert that *A* is is to assert that *F* is. And to deny that *F* is is to deny that *A* is.

A hypothetical major premiss, then, 'If *A* is *B*, *C* is *D*,' may have for subsumption, not the flat assertion that *A* is *B* or that *C* is not *D*, but the hypothetical assertion that *A* is *B* if *E* is *F*, or that *C* is not *D* if *G* is *H*. Conclusion—If *E* is *F*, *C* is *D*. If *G* is *H*, *A* is not *B*.

It is the difference between—

> Every *MS* is a *PS*.
> This *S* is an *MS* (or, Every *S* is an *MS*).
> Therefore This *S* (or, Every *S*) is a *PS*.

and—

> Every *MS* is a *PS* (If any *S* is *M*, it is *P*).
> Every *XS* is an *MS* (If any *S* is *X*, it is *M*).
> Therefore Every *XS* is a *PS*.

or (in Fig. II), with the same major premiss—

> No *XS* is a *PS* (If *S* is *X*, it is not *P*).
> Therefore No *XS* is an *MS*.

driving. Therefore an accident is possible (may occur).' Or the particularity may be in the condition. ' If John sometimes has an accident, he is an unsafe driver. He does sometimes have an accident. Therefore, &c.' This is in *Barbara*. The following also is in *Barbara* not *Darii*, since the particularity is in the term rather than in the subsumption or the sumption. ' If some kings are unwise, monarchy is not a good institution. Some kings are unwise. Therefore, &c.'

[1] Hamilton, *Lectures on Logic*, ii. 390. We must beware how we carry on a *limitation* from the minor premiss into the conclusion. Thus—' If *A* is *B*, *C* is *D*. It is barely (or scarcely) possible that *A* is *B*. Then it is barely (or scarcely) possible that *C* is *D*.' A fallacy. Limitation is of the nature of negation. We have not posited but sublated the antecedent.

If A is true, B is true. But B is untrue if C is true. Therefore if C is true A is untrue, and if A is true C is untrue (*Camestres* and *Cesare*). That is, if two hypotheses have contradictory consequences, the truth of either involves the untruth of the other.

§ 943. In Figure I then the explicated form will be—

<div style="display:flex">

Barbara.
If A is B, C is D
If E is F, A is B
Then if E is F, C is D.

Darii.
If A is B, C is D
If E is F, A sometimes is B
Then if E is F, C sometimes is D.

Celarent.
If A is B, C is not D
If E is F, A is B
Then if E is F, C is not D.

Ferio.
If A is B, C is not D
If E is F, A sometimes is B
Then if E is F, C sometimes is not D.

</div>

Note, that 'If E is F, A sometimes is B' is equivalent to 'Sometimes, if E is F, A is B'—some cases of E being F are cases of A being B. Therefore some cases of E being F are cases of C being D, or not being D.

Figure II.

Cesare.
If A is B, C is not D
If E is F, C is D
Then if E is F, A is not B (the suppositions are incompatible).

Festino.
If A is B, C is not D
If E is F, C sometimes is D
Then if E is F, A sometimes is not B.

Camestres.
If A is B, C is D
If E is F, C is not D
Then if E is F, A is not B.

Baroco.
If A is B, C is D
If E is F, C sometimes is not D
Then if E is F, A sometimes is not B.

Figure III.

Darapti.
If A is B, C is D
If A is B, E is F
Then if E is F, C sometimes is D.

Datisi.
If A is B, C is D
If A is B, E sometimes is F
Then if E is F, C sometimes is D.

Disamis.

If A is B, C sometimes is D

If A is B, E is F

Then if E is F, C sometimes is D.

(This seems plainer than the reasoning in *Datisi*. But in reality it is an indirect conclusion, obtained by simple conversion from the direct conclusion, If C is D, E sometimes is F.)

Felapton.	*Ferison.*
If A is B, C is not D	If A is B, C is not D
If A is B, E is F	If A is B, E sometimes is F
Then if E is F, C sometimes (at least) is not D.	Then if E is F, C sometimes is not D.

Bocardo.

If A is B, C sometimes is not D

If A is B, E is F

Then if E is F, C sometimes is not D.

(This again seems plainer than *Ferison*; yet it yields only an indirect conclusion converted from 'If C is not D, E sometimes is F'.)

Figure IV.

Bramantip.	*Dimaris.*
If A is B, C is D	If A is B, C sometimes is D
If C is D, E is F	If C is D, E is F
Then if E is F, A sometimes is B.	Then if E is F, A sometimes is B.

Camenes.

If A is B, C is D

If C is D, E is not F

Then if E is F, A is not B.

Fesapo.	*Fresison.*
If A is B, C is not D	If A is B, C is not D
If C is D, E is F	If C is D, E sometimes is F
Then if E is F, A sometimes is not B.	Then if E is F, A sometimes is not B.

§ 944. It will be observed, however, that while in Figure I there is a conditional positing (in whole or part) of the antecedent contained in the major premiss, and in Figure II there is a conditional sublation (in whole or part) of the consequent

contained in the major premiss, in Figure III, on the other hand, where the middle term ('If *A* is *B*') is the antecedent condition of *both* premisses, there is not, as the Figure stands, either position of antecedent or sublation of consequent. The Moods must be reduced to one of the two former Figures before either can appear. *Darapti* and *Datisi, Felapton* and *Ferison* must convert the minor premiss—

> If *A* is *B*, *C* is *D* (or not *D*)
> If *E* is *F*, *A* is sometimes *B*
> Then if *E* is *F*, *C* is sometimes *D* (or not *D*). (*Darii, Ferio*) ;

while *Disamis* must transpose its premisses and convert the original major—

> If *A* is *B*, *E* is *F*
> If *C* is *D*, *A* is sometimes *B*
> Then if *C* is *D*, *E* is sometimes *F*. (*Darii*.)

§ 945. In the Fourth Figure *Bramantip, Dimaris* and *Camenes* need only to have their premisses transposed for the conditional positing of the antecedent (*E* is *F*) to appear. In *Fesapo* and *Fresison*, however, when the premisses are transposed, there appears only sublation of the antecedent, which affords no inference. We must not then transpose the premisses, but rather convert the minor, when we obtain a sublation of the consequent—

> If *A* is *B*, *C* is not *D*
> If *E* is *F*, *C* sometimes is *D*
> Then if *E* is *F*, *A* sometimes is not *B*. (*Festino*.)

§ 946. The above hypothetical Forms are well worth study. The illative process in them is not so obvious as in the ordinary categorical syllogisms. But they make it even more clear that the two former Figures are greatly superior to the two latter, Figure I exhibiting the result of affirming the antecedent, Figure II that of denying the consequent. Grant the cause, the effect must follow. Deny the effect, the cause disappears. The formula 'As *A* is *B* is' is a misleading substitute for 'If *A* is *B* is'; for *B* may exist without *A*, but *A* cannot exist without *B*.

§ 947. A word should be added about the conjunction *if* with the adversative force referred to above, of *although* or *even if*,

implying a rule or natural expectation to the contrary. 'If I should die with Thee I will not deny Thee.' 'Were there neither heaven nor hell, yet sin should be my hell and holiness my heaven' (*Divine Breathings*). Similarly concessive *while* (Latin *ut*), &c.[1] The sublation of the consequent, in such a sentence, does not negate the antecedent in the sense of taking from it but rather of adding to it. The case of St. Peter denying his Master would be a sign not of his not dying with Him, but of his having to suffer some greater extremity. So, categorically, '*Even* a savage has virtues.' '*Even* a worm will turn.' A being without virtues must be *more* inhuman than a savage. A creature that will not turn must be *more* spiritless than a worm—must be beyond the *limit*. 'Up to a certain limit at least' is the sense of *Even*.

[1] In Suetonius' phrase, 'Oderint dum metuant,' however, the grammatical apodosis 'oderint' is really the concession in thought—'However much they may hate, I do not care, on condition that they fear'.

CHAPTER XXVIII

DISJUNCTIVE REASONING

§ 948. So far we have considered the principle of hypothetical judgement generally. It involves a conjunctive synthesis. The Disjunctive Judgement is a particular case, or aspect, of hypothetical statement. Instead of *If—then*, it is marked by *Either—or*.

> Either *A* is or *B* is.
> Either *A* is *B* or it is *C*.
> Either *A* is *B* or *C* is *D*.

Either—or means, If not one then the other. It is thus seemingly a duplex judgement. *All non-X is Y*, and *All non-Y is X*. Whether the import is also exclusive—*All X is non-Y* and *All Y is non-X* —will be considered below; e. g. whether ' She will weep or she will die ' formally and necessarily means that if she weeps she will not die.

§ 949. A disjunctive judgement can take the following leading forms :—

(1) *A* is either *B* or *C*. Either *A* is *B* or *C* is *D*. He is either a knave or a fool. Either you said it or I am dreaming. (All non-*X* is *Y* and all non-*Y* is *X*.)

(2) *A* is either *B* or not *C*. Either *A* is *B* or *C* is not *D*. He was either impudent or not sober. Either the train is late or my watch is not correct. (*All non-X is non-Y*, and *All Y (all not non-Y) is X*.)

(3) *A* is either not *B* or not *C*. Either *A* is not *B* or *C* is not *D*. Either you do not understand, or you are not telling the truth. Either the train is not punctual or my watch is not correct. (*All X (not non-X) is non-Y*, and all *Y (not non-Y) is non-X*.)

(4) Either *A* or *B* is *C*. Either author or printer made a slip. In practice this commonly means that the choice is confined to *A* and *B exclusively*, so that if *A* is *C* nothing else is *C*; and

the same with *B*. (4) is in *that* case not distinguishable from '*C* is either *A* or *B*'. It must be either *A* or *B* that is *C*. Whoever made a slip (the slip) was either author or printer.   Any not-author-made slip was a printer-made slip, and vice versa. It is clearly meant that no one else could have had a hand in the mistake.   The proposition is convertible.   But 'Either James or Edward tells lies' does not mean that no one else tells lies.   What it means is that every supposition of the one not telling lies *includes* and involves the certainty of the other telling them.   So that 'Every non-*XZ* is *YZ*' ought not to be understood to mean that *L*, *M* or *N* cannot be *Z*, so long as the extension of *L*, *M* or *N* coincides with that of *X* or *Y* or with part of either.   All telling lies under the supposition of James not telling them includes their being told by Edward, and vice versa.

(5) Similarly with, Either *A* or *B* is not *C*.   Either prosecutor or defendant is not telling the truth.   And

(6) Either *A* is *C* or *B* is not *C*.   Either the man is guilty or the witness is not to be believed.

But the best general type for Disjunctive Judgement is— Either *A* is *B* or *C* is *D*.[1]

§ 950. *Either—or* is contradicted by *Neither—nor*.   But ' All *A*'s are either *B* or *C*' is contradicted, not by 'All *A*'s are neither *B* nor *C*', but by 'Some *A*'s are neither *B* nor *C*'.   (If the disjunction is understood exclusively, 'It must be either one or the other' is contradicted by 'It is both one and the other'. 'You can either eat your cake or have it' by 'I can eat my cake *and* have it'.)   The contradiction of '*A* is always either *B* or not *C* might be phrased, 'Sometimes *A* is *C* without being *B*'; or, 'Sometimes *A* is not *B* and yet is *C*.' '*A* is either not *B* or not *C*' is countered by the allegation, '*A* is both *B* and *C*.' 'Either *A* is not *B*, or *C* is not *D*', is contradicted by 'Sometimes *A* is *B* and *C* is also *D*'. 'Either *A* or *B* is not *C*' is contradicted by ' Both *A* and *B* may be *C*'.

[1] For, as the letters stand for any terms, this does not exclude the possible identity of any pair of them ; nor does it exclude any term from being negative.
    (1) Either *A* is *B* or *C* is *D*.
    (2) Either *A* is *B* or *C* is *B*.
    (3) Either *A* is *B* or *A* is *D*.
    (4) Either *A* is *B* or *C* is *A*.

(*Disiunctio ambigui.*)
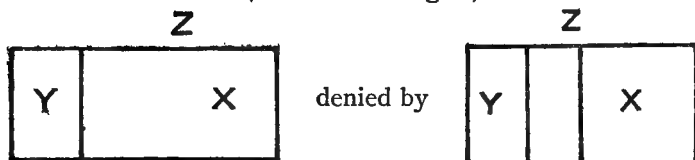
In Extension $Z = YZ + XZ$, $YZ =$ non-XZ, $XZ =$ non-YZ. This is denied by 'Some non-YZ is not XZ.'

§ 951. But the question arises whether 'Z is either Y or X' is *exclusive* as well as *alternative*, in which case this proposition contains prima facie four judgements:—

(1) If Z is not Y it is $X =$ All not-YZ is XZ.
(2) If Z is not X it is $Y =$ All not-XZ is YZ.
(3) If Z is X it is not $Y =$ No XZ is YZ.
(4) If Z is Y it is not $X =$ No YZ is XZ.

The two latter, however, are clearly one and the same judgement, and the two former will also be found to be identical. One member in each case is the converse by contraposition of the other. So that the question is whether the Disjunctive Judgement comprises, or can comprise, a double assertion, that *This is one thing or the other, alterutrum, and cannot be both.* I say that Z, or any particular Z, is found either in the X class or

(5) Either A is B or B is D.
Now if we ring the changes on (1) by making some or all of the terms negative, we get—

  (i) Either not-A is B or C is D.
  (ii) Either A is not B or C is D.
  (iii) Either A is B or not-C is D.
  (iv) Either A is B or C is not-D.
  (v) Either not-A is not-B or C is D.
  (vi) Either not-A is B or not-C is D.
  (vii) Either not-A is B or C is not-D.
(viii) Either A is not-B or not-C is D.
  (ix) Either A is not-B or C is not-D.
  (x) Either A is B or not-C is not-D.
  (xi) Either not-A is B or not-C is D.
  (xii) Either A is not-B or not-C is not-D.
(xiii) Either not-A is B or not-C is not-D.
(xiv) Either not-A is not-B or C is not-D.
  (xv) Either not-A is not-B or not-C is not-D.

Thus there are fifteen variations to be had from (1) alone. The total number then will be $15 \times 5 = 75$. I owe this note to Mr. Stock.

in the Y class. If these classes overlapped it might be found in both. But do I say further that they do not overlap?

If I do, then in ἢ θηρίον ἢ θεός, then, are involved four judgements—(1) θηρίον, οὐ θεὸς ἄρα : (2) θεός, οὐ θηρίον ἄρα : (3) οὐ θηρίον, θεὸς ἄρα : (4) θεός, οὐ θηρίον ἄρα. But if the alternatives are not exclusive, the two former must be struck out. Now (1) and (2) are rationally one judgement—as No X is Y and No Y is X are rationally one judgement (or All X is non-Y and All Y is non-X) —and (3) and (4) are also interchangeable statements—as All non-X is Y and All non-Y is X are equivalents. Mill finds unnecessary fault with Hamilton here :—

'Much as he had thought on the subject, the simple idea never seems to have occurred to him that every disjunctive judgement is compounded of two or more hypothetical ones. "Either A is B, or C is D" means If A is not B, C is D ; and if C is not D, A is B. This is obvious enough to most people ; but if Sir W. Hamilton had thought of it, he probably would have denied it ; its admission would not have been in keeping with the disposition he shows, in so many places, to consider as one judgement all that it is possible to assert in one formula.'[1]

§ 952. But Mill further complains that Sir William 'takes for granted through the whole of his exposition that when we say A is either B or C we imply that it cannot be both'.[2]　In adopting the exclusive view of disjunction—*expressio unius est exclusio alterius*—Hamilton doubtless does hold that a single formula implies a single judgement ; for while that view, as we have seen, implies the duplex judgement, 'All non-X is Y' and 'All X is non-Y', Hamilton would no doubt consider this a single judgement expressed by his formula, 'All non-X is all Y.'—which implies, of course, that All non-Y is all X.　Mill, I conceive, is wrong in objecting to the doctrine that a single formula expresses a single judgement. The true objection to the formula 'All non-X is all Y' (in other words, to the exclusive view of Disjunction) is, as Mill elsewhere lucidly insists, that it is only admissible as a formula, and can only represent a single judgement, when the terms are taken as totalities. If 'All A is all B' is to be taken distributively, it is, as we have seen under Quantification of the Predicate, a clumsy and logically inadmissible complex of the two judgements, 'Every A is B' and 'Every B is A'. 'All non-A is all B' is similarly an

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[1] *On Hamilton*, p. 530.　　　　　　　　[2] Ibid. p. 528.

objectionable expression of the two judgements, 'Every non-*A* is *B*' and 'Every *B* is non-*A*'. The former, which is disjunctive, does not formally involve the latter.

We have therefore to distinguish between two kinds of Disjunction. Speaking of the total extension of *Z* as a class, we may say that it is divided into the extensions or classes *X* and *Y*. To express this in the formula, '*Z* is either *X* or *Y*,' is permissible. The whole class of *Z*'s which are not *X*'s is identical with the whole class of *Y*'s; or (which is the same thing) the whole class of *Z*'s which are not *Y*'s is identical with the whole class of *X*'s. All non-*XZ* is all *YZ*. All non-*YZ* is all *XZ*, or vice versa. Such disjunction is Division of a Concept, according to its Extension. The genus is composed of its co-ordinate species, which together exhaust it.

§ 953. But it is different when we speak of Every several *Z*—*Z* distributively—or of This or That *Z*. This is no longer Division but Determination. 'Bankrupts are either unfortunate or dishonest' is a divisive judgement. It divides the class Bankrupt under those two heads. Some are one some the other (*partim . . . partim*). If the meaning is that the number of bankrupts who are not unfortunate is identical with the number who are dishonest, and vice versa, this is a single judgement about aggregates. But if we judge of any individual bankrupt that he is either unfortunate or dishonest, the suggestion that he is not both constitutes a further judgement. We saw this in treating of Definition. 'Every *X* is a non-*YZ*' may be intended to suggest that every non-*YZ* is an *XZ*. If we understand that *X* is being defined, we take the words in that sense. But they do not formally convey it, and the identification of the extensions of subject and predicate is in truth a separate judgement. It is equally correct to say that a savage is a human being who is not civilized, and that he is a human being who does not live in Belgravia. But the one is a definition, the other is not. Many people who do not live in Belgravia are not savages.

Definition   —*X* is a non-*YZ*.
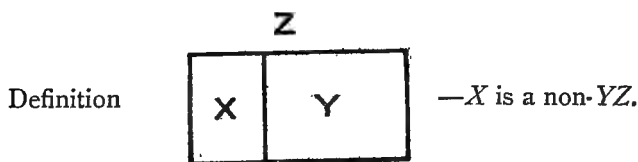
Z̄

Description

| X | Y | W |

—*X* is a non-*YZ*.

§ 954. *Disiunctio ambigui.* This brings us to the *Disjunction of Uncertainty.* ' Every *Z* is either *X* or *Y* ', means that each several *Z* will be found in the one class or the other. The *X*'s are together made up of those two classes. But in saying of each several *Z*, ' This *Z* is either *X* or *Y*,' we usually mean that we do not know to which class he belongs. Sailors are either in the King's service or the mercantile marine. They are, as a class, in both. But ' This sailor is either in the Navy or merchant service ' implies what has been called a *disjunction of ignorance,* or of doubt. So also in placing a class of things under a higher class, ' Sea anemones are either animal or vegetable.' ' Whales are either viviparous or oviparous.' ' Free libraries are either useful or mischievous.' ' Planets either shine by their own light or are lighted by the sun.'

Of the same nature is the disjunction referred to a point of time. Distinguish ' He is always either reading or writing ' from ' He is now either reading or writing '; and ' The signal is always either at safety or at danger ' from ' The signal is at this moment either at safety or at danger.' [1]

§ 955. The members of a Disjunction are, of course, reciprocally exclusive—i. e. ' Either *A* or *B* ' means not only ' All not-*A* is *B* ', but ' No *A* is *B* (All *A* is not-*B*) '—when the choice

[1] Sigwart observes : ' Trendelenburg's doctrine that the disjunctive judgment is a statement of the extension of the subject concept applies only to those disjunctive judgments which are based upon a division of the subject concept. It is not applicable when the disjunction refers to changeable states ' (*Logic*, i. 231 n.). This is an unnecessary distinction. The disjunction of uncertainty must be preceded by, and based upon, a divisive judgement in all cases. A doubt whether the water in the jug is at this moment hot, cold or tepid, is based upon a division of water temperature into those three states. It is objected to me that ' A pig is either asleep or eating' is of different calibre from ' A triangle is either equilateral, isosceles or scalene'. The latter exhausts the extension of ' triangle'. Does the former exhaust the extension of ' pig'? I reply that it exhausts the extension of the state of a pig. The distinction does not go deeper than the distinction between ' The church is always open ' and ' Churches are always interesting '.

is between contradictories, i. e. when $B = $ not-A. Every several Z is either X or non-X. Such a disjunction of contradiction is not empirical, but is necessitated by the Principle of Excluded Middle. It is true even if no Z at all is X. The caution, however, must here be repeated against confusing negative with privative conception. Of all armchairs it may be predicated that either they are happy or they are not happy. But we cannot divide armchairs into happy and unhappy. We have no right, then, to divide Z into XY and non-XY, unless all Z's are Y, nor into X non-Y, and non-X non-Y, unless no Z's are Y.

> Lord, it belongs not to my care
> Whether I die or live.

The possible contingencies (Z) are either dying (X) or not dying (non-X). If both alternatives are apart from care (non-Y), then whatever may befall me belongs not to my care (no Z is Y).

§ 956. The empirical Disjunction may have many members. A is either B or C or D or E, &c. But we could not say, A is either B or not-B, or C, or D, &c. Rather, A is either B or not-B ; in which latter case it is either C or D or E, &c. (or C and not-C, and so forth).

§ 957. Why so many logicians have regarded the terms of the empirical disjunction as always reciprocally exclusive[1] is perhaps that in the illustrations chosen by them there is a material or quasi-formal incompatibility. Cicero says : 'Graeci dicunt omnes aut Graecos aut barbaros esse.' Even in the famous dilemma about the Son of Man, 'aut Deus aut non bonus homo,' what is insisted on is not that He cannot have been both

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[1] Mansel dissents emphatically from this opinion. 'But let us grant for a moment the opposite view, and allow that the proposition, "All C is either A or B," implies, as a condition of its truth, "No C can be both." Thus viewed, it is in reality a complex proposition, containing two distinct assertions, each of which may be the ground of two distinct processes of reasoning, governed by two opposite laws. Surely it is essential to all clear thinking that the two should be separated from each other, and not confounded under one form by assuming the Law of Excluded Middle to be, what it is not, a complex of those of Identity and Contradiction' (*Proleg. Logica*, p. 221).

Caesar Borgia having adopted the motto 'aut Caesar aut nihil', this gave rise to the following epigrams :—

(1)   Borgia Caesar erat factis et nomine Caesar.
      Aut nihil aut Caesar, dixit. Utrumque fuit.

(2)   Aut nihil aut Caesar vult dici Borgia. Quidni?
      Cum simul et Caesar possit et esse nihil.

(unspeakably impossible though it be), but that if He was *not* the one He was the other. This is so, again, in the · · · case of a signal being at danger or at safety. Equally, dead and alive, free and under compulsion, are contradictories (within the sphere to which they belong) as well as contraries. The same thing applies to the lines quoted by Hamilton[1] from Purchot, beginning—

> *Falleris aut fallor ; fallor ; non falleris ergo.*

We cannot (in a supposed case) both be wrong. I am wrong. Then you are not wrong. Or again, 'This is either true or false.' Even when he takes a proposition with three disjunct members, Hamilton selects three which are severally exclusive as well as together exhaustive. E. g.—

The ancients were in genius either superior to the moderns, or inferior, or equal.

Now the ancients were superior.

Therefore, they were neither inferior nor equal.[2]

This throws no light on the question whether we ought to argue—

A is either B or C or D.

A is B. Then it is neither C nor D.

For we do not know whether B excludes C and D. If, being told that some one was born either in 1850, 1851 or 1852, I find he was born in 1851, and thereupon deny that he was born in 1850 or 1852, I can do this, not from the form of the Disjunction, but from knowing that birth only takes place once —a good instance of the material nature of the *modus ponendo tollens*. Mill, on the other hand, insists that if we say that to make an entirely unselfish use of despotic power a man must be either a saint or a philosopher, we do not necessarily mean that the same person cannot be both saint and philosopher.[3] In religion, on the other hand, a definite side must be chosen. 'He that is not with Me is against Me.' But the knowledge that alternatives are mutually exclusive is always extra-logical.

§ 958. The Disjunctive Syllogism has a disjunctive proposition for major premiss. It is only, in fact, one form of the Hypothetical Syllogism. 'She must weep or she will die' is equivalent to 'If she does not weep she will die'. The *modus ponens* of the latter—'She does not weep ; then she will die'—is the *modus*

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[1] *Lectures on Logic*, i. 327.   [2] Ibid. p. 330.
[3] *On Hamilton*, p. 529.

tollendo ponens of the former. The *modus tollens* of the ordinary hypothetical syllogism—'She will not die; it follows that she weeps'—is again the *modus tollendo ponens* of the Disjunctive form, but it is now the alternative ('she will die') which is sublated.

§ 959. To what, then, does the *modus ponendo tollens* of the Disjunctive syllogism correspond in the ordinary Hypothetical form? It has no valid place there, and least of all in those cases where antecedent and consequent are convertible. In conjunctive reasoning *ponendo ponimus*, not *tollimus*; and positing the consequent, where not convertible with the antecedent, has no result. The *modus ponendo tollens* has only a formal place in *contradictory* disjunction, and only a material place where there is a material incompatibility. The disjunction, 'A is either B or not-B,' expressed conjunctively, becomes, 'If A is not B it is not-B.' (No not-BA is B.) He is either awake or asleep (disjunctive). If he is not awake he is asleep (conjunctive). Now in the latter or hypothetical form, by affirming that he is asleep we should not logically be affirming that he is not awake, unless *asleep* and *not awake* be given first as equivalent.

§ 960. Indeed, what Hamilton says about Hypothetical reasoning being not mediate but immediate is true of Contradictory Disjunction, though of this only. In other words, there is no reasoning at all. To take the old example—

Sempronius is either honest or dishonest.

Affirmative, or *Modus ponendo tollens*.	Negative, or *Modus tollendo ponens*.
Now Sempronius is honest.	Now Sempronius is not honest.
Therefore he is not dishonest.	Therefore he is dishonest.

There is here no mediation, and therefore no inference. The conclusion follows from the *soi-disant* minor premiss, not by the help of the major premiss, but on the strength of the Principle of Contradiction in the Affirmative mode, of the Principle of Excluded Middle in the Negative mode. The major premiss—apart from any question about 'is not honest' meaning 'is dishonest'—might be altogether omitted. There may be more appearance of subsumption when the major premiss is universal and the minor singular or particular:—

Every A either is B or is not B.
This A is B. Therefore it is not not-B.

But here too the major premiss is wholly superfluous. Moreover it does not express a real hypothesis, or connect a real antecedent and consequent, but is a mere truism, a mere case of the fundamental Law of Reason which is the true major premiss of the reasoning.[1]

Ponendo tollens.	*Tollendo ponens.*
Nothing can be something and also its contradictory.	Everything is everything or else its contradictory.
A is something (viz. B).	A is not a certain thing (viz. B).
Then A is not that thing's contradictory, viz. not-B.	Then A is that thing's contradictory, viz. not-B.

[1] On the other hand, when the disjunction is not a dichotomy, but of the form, 'A is either B or C,' I fail to understand the meaning of Dr. Bosanquet's assertion that 'the categorical minor adds nothing whatever in the way of content to the disjunctive major premise. It only has meaning as resolving a doubt, or as affirming one member of an alternative to be true in a given point of time. . . . In the true disjunction, which expresses the organization of a system as such, the reference to an arbitrary condition falls away. . . . We are thus driven to the paradoxical conclusion that the essence of disjunctive argument is included within the disjunctive " major premise "; in other words that this judgment is in fact not a mere premise but at once a categorical judgment and a complete systematic inference. . . . The disjunction must be taken to correspond not to the major premise of the syllogism but to the whole syllogism' (*Logic*, ii. 190–92). This is too subtle. I take Dr. Bosanquet to mean something like this. 'Z's are either X's or Y's' expresses no disjunctive doubt, but simply divides the class of Z's into two divisions $Z = X + Y$. It adds nothing in the way of content to this proposition to say that any particular Z is an X (or is a Y), for we must be supposed to know this already, just as if we say 'All the months of last year were wet' we necessarily include March, and do not need to add that March was wet. 'All my sons are in the Army or the Navy' is stated with the knowledge that James is in the Navy. This, however, looks like the old *petitio principii* complaint against the syllogism generally, viz. that the minor premiss is already included in the major (*vide infra*). To show the real character of a disjunctive syllogism it might be expressed thus :—

  Z's are either X or Y (division of class).

  Then this Z is either X or Y (doubt about individual member).

  It is not X (minor premiss).

  Then it must be Y.

In a disjunctive proposition, 'Either A is B or C is D' (or, 'A is either B or C'; or, 'Either A or B is C'), it is immaterial which member we regard as antecedent and which as consequent. 'Time must friend or end' (*Troilus and Cressida*). All non-BA is DC is equivalent to All non-DC is BA. A minor premiss, then, of negative form may stand either as a negation of the consequent (Figure II in categorical reasoning) or as affirmation of the antecedent (Figure I). It may be of any quantity.

§ 961. The simplest form of the Conjunctive Judgementwe saw to be ' If *A* is, then *B* is '. Of the Disjunctive Judgement the two simplest forms are, ' *A* is either *B* or *C* ' and ' Either *A* or *B* is *C*.' We can further combine conjunction and disjunction in the same judgement. The most elementary forms are, ' If *A* is, then either *B* or *C* is ' ; and, ' If either *A* or *B* is, then *C* is.' The judgement is conditional, but either antecedent or consequent is disjunctive.

More fully.· If *A* is *B* then either *C* is *D* or *E* is *F*.

Or, Whether *A* is *B* or *C* is *D*, then in either case *E* is *F*. Now positing the condition, the consequent follows. *A* is. Then either *B* or *C* is. *A* is *B* ; then either *C* is *D*, or *E* is *F*. Again, Either *A* or *B* is. Then *C* is. Either *A* is *B* or *C* is *D* Then *E* is *F*.[1]

Or, denying the Consequent, the Antecedent is destroyed. Neither *B* nor *C* is. Then *A* is not. Neither *C* is *D* nor *E* is *F*. Then *A* is not *B*. Again, *C* is not. Then neither *A* nor *B* is. *E* is not *F*. Then neither *A* is *B* nor *C* is *D*.

§ 962. Such a Syllogism does not vary from the ordinary Conjunctive Syllogism in principle, the only difference being that either in Antecedent or Consequent a disjunctive judgement takes the place of a simple judgement. Or the disjunction may occur in both Antecedent and Consequent. If either *A* is or *B* is, then either *C* is or *D* is. If *A* is either *B* or *C*, it is either *D* or *E*. If either *A* is *B* or *C* is *D*, then either *E* is *F* or *G* is *H*. Of course there may be as many members in a disjunction as we please. If *A* is *B* or *C* is *D* or *E* is *F*, then either *G* is *H* or *I* is *K* or *L* is *M*. Examples—

§ 963. *A.* Simple.

I. (i) *Constructive.*

If he said this he was either mad or wicked.

He did say it (*modus ponens*).

Then he was either mad or wicked.

The conclusion will be of the same quantity as the minor premiss, but of the opposite quality.

[1] Hamilton observes that 'every syllogism that has a disjunctive sumption is not, on that account, necessarily a disjunctive syllogism '. The syllogism, ' *B* is either *C* or *D* ; but *A* is *B* ; then *A* is either *C* or *D*,' is exactly analogous to the syllogism, ' *B* is *C* ; *A* is *B* ; then *A* is *C* ' (*Lectures on Logic*, i. 328). But this merely means that the principle of all syllogism is the same.

(ii) *Destructive.*

He was neither mad nor wicked (*modus tollens*).

Then he did not say it.

II.   (i) *Constructive.*

Whether among friends, or by myself, I am at ease.

You know that I am either among friends or by myself (*modus ponens*).

Therefore you may be sure I am at ease.

(ii) *Destructive.*

I am not at ease (*modus tollens*).

This shows you that I am neither among friends nor by myself.

B. DOUBLE.

III.   (i) *Constructive.*

If he either was married or lived in that parish, you will either find his name in the church registers or will hear of him by inquiry.

He certainly either was married or lived there (*modus ponens*).

Then either his name will be in the registers or else you will learn of him by inquiry.

(ii) *Destructive.*

His name is not in the registers and I can learn nothing by inquiry (*modus tollens*).

Then he neither was married nor lived there.

§ 964. We can express 'If either A is B or C is D, in both cases E is F' by a double proposition—'If A is B, E is F, and also if C is D, E is F'. But we cannot express 'If A is B, either C is D or E is F' by the two propositions 'If A is B, C is D', and also 'If A is B, E is F'.

The double disjunction, as above (III) is not a very usual or natural form—'If either A is B or C is D, then either E is F or G is H'. If the meaning is that 'E is F' is the consequent of A being B, and 'G is H' is the consequent of C being D, we should express it thus—'If A is B, E is F, and if C is D, G is H'.

The minor premiss and conclusion, however, will always be,—

But either A is B or C is D.

Then either E is F or G is H.

or else (*modus tollens*)—

> But neither E is F nor G is H.
> Then neither A is B nor C is D.

§ 965. Whately gives this illustration :—

If the world existed from eternity there would be records prior to the Mosaic. And if it were produced by chance, it would not bear marks of design.

But there are no pre-Mosaic records, and the world does bear marks of design (*modus tollens*). Therefore it neither existed from eternity, nor is the work of chance.

§ 966. The Dilemma is a syllogism with a complex conjunctive major premiss and a disjunctive minor premiss. Its simplest form is, constructively—

If A is B it is C; and if A is D it is C,
But A is either B or D (disjunctive affirmation),
∴ A is in either case C,

or destructively :—

If A is B it is C; and if A is D it is E.
But either A is not C or it is not E (disjunctive denial).
Then either A is not B or it is not D.

The following is a Constructive Dilemma—

Whether we live we live unto the Lord, and whether we die we die unto the Lord.

[But we must either live or die.]

Whether we live, therefore, or die we are the Lord's.

The following, from Whately's *Logic*, is a Destructive Dilemma—

' If this man were wise he would not speak irreverently of the Scripture in jest; and if he were good he would not do it in earnest.

But he does it either in jest or earnest.

Then he is either not wise or not good.

It should be observed that the affirmative form of the Minor Premiss does not make or prevent this from being a Destructive Dilemma. The two consequents are negative, and so are sublated by an affirmative.

§ 967. When the antecedent is a disjunction of contradictory

alternatives [1] the major premiss may be expressed in either of two ways:—' Whether *A* is *B* or is not *B*, *C* is *D*,' and, ' If *A* is *B*, *C* is *D*, and if *A* is not *B*, *C* is *D*.' Marcus Aurelius writes :—' It were well to die if there be gods, and sad to live if there be none.' But contradictory disjunction can have no place in the consequent. ' If *A* is *B* then either *C* is *D* or is not *D* ' is a superfluous and useless proposition, for *C* must either be or not be *D* independently of *A* being *B* or of any other condition, in virtue of the principle of Excluded Middle. Such a consequent could not be sublated. It should be noticed also that ' If either ' introducing an antecedent should rather be ' Either if ', which can be expressed as ' Whether '. A disjunctive antecedent does not usually contain a disjunction of ignorance— ' If it be the case that either *A* is *B* or *C* is *D*, then in that case,' &c.—, but means in either (both) of two possible cases, so that *either* (*both*) can be transferred to the *vinculum*, so as to introduce the consequent. ' If *A* is *B* or if *C* is *D*, in either case it is true that *E* is *F*.' This will appear more clearly in the case of *contradictory* disjunction, ' If either *A* is *B* or *A* is not *B* ' is meaningless. *A* is necessarily either *B* or not *B*, and no ' if ' is needed.

§ 968. The argument, ' If *A* is true *B* is true ; if *A* is untrue *C* is true—therefore either *B* or *C* is true,' may be expressed thus in *Barbara*—

> If *B* is untrue *A* is untrue.
> If *A* is untrue *C* is true.
> Then, if *B* is untrue *C* is true.

And similarly, if *C* is untrue *B* is true. By a strange slip Sigwart adds, ' That is, the consequence of an affirmation and the consequence of its denial are mutually exclusive ' (i. 329 n.).

§ 969. McCosh [2] gives the two following examples :

If a man can help a thing he should not fret about it. If he cannot help a thing he should not fret about it.

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[1] ' Heads I win ; tails you lose ' is a mere trick of speech, suggesting to the mind that ' I win ' and ' you lose ' are contradictory consequents, instead of being one and the same. Heads and tails are, in speaking of a coin, contradictories. The proposition is of the form, ' Whether *A* is or is not *B*, in either case *C* is *D*.' It is like ' Tide life, tide death, I come without delay' (*Midsummer Night's Dream*), or, ' Will you, nill you, &c.' —though, to be sure, between willing and nilling comes indifference.

[2] *Laws of Discursive Thought*, p. 150.

But he can either help it or not help it.
Therefore he should not fret about it.

If that narrative be true you must believe it.
If it be false you must disbelieve it.
But it must either be true or false.
Therefore you must either believe it or not believe it.

The second example, however, is only in form a dilemma. It has a contradictory disjunction in consequent as well as in antecedent. The reasoning proceeds smoothly. But it guides us to a conclusion which is self-evident quite independently of the premises. We might as well argue: 'You must either believe or disbelieve it. Therefore it is either true or untrue.' I assume that *true* and *untrue, believe* and *disbelieve* are intended here as contradictories, though, strictly speaking, as McCosh points out, a narrative may be partly true and partly false, and belief may be partial or entire. Dilemmas are frequently fallacious by assuming that no third supposition is possible. Such a fallacy of false assumption, however, is material, not formal.

§ 970. The following is a good Dilemma—'Neither if we eat are we the better; neither if we eat not are we the worse'. As we must either eat or eat not, it follows that we shall be either none the better or none the worse. These, observe, are not contradictories. It is possible to be both none the better and none the worse. Between *better* and *worse* is a third possibility, *neither one nor the other*. And this is what St. Paul means. Whether we eat or eat not is indifferent.

§ 971. The Apostle frequently uses the dilemma—e. g. just before—'He that eateth eateth unto the Lord, for he giveth God thanks; and he that eateth not, unto the Lord he eateth not, and giveth God thanks.' Again—'Some preach Christ even of envy and strife, and some also of good will. . . . What then? Only that every way, whether in pretence or in truth, Christ is preached.'

§ 972. Archbishop Whately remarks that many arguments which are commonly called dilemmas 'hardly differ from *simple* conditional Syllogisms.' In fact, a dilemma is often sufficiently expressed by a single proposition—e. g. 'It is cheap, whichever way you look at it.'

§ 973. The distinction between the Double Destructive Conjunctive Syllogism ('If A is B, E is F; and if C is D, G is H.

But neither E is F nor G is H. Therefore neither A is B nor C is D') and the Destructive Dilemma is plain, if we notice that *neither . . . nor* is two denials (so that we might equally well have said, 'E is not F; therefore A is not B; and G is not H; therefore C is not D'), whereas *either . . . or* is not two affirmations, but only one. We could not replace 'Either A is B, or C is D; therefore either E is F or G is H' by 'A is B, therefore E is F; and C is D, therefore G is H'.

§ 974. The word Dilemma merely means a double *lemma* or sumption. If A is B it is either C or D. 'If A is B it is either C or D or E' would be a Trilemma.[1] 'If A is B it is either C or D or E or F' would be a Tetralemma—contradicted by 'If A is B it is neither C nor D nor E nor F'. And so forth. But the expression commonly conveys the idea of controversial argument, in which you say to an opponent, 'It must be either one or the other. Take your choice. In either case the consequence will be unpalatable to you.' The dilemma is regarded as a particularly triumphant method of reasoning. The antagonist if not impaled on one horn will be gored by the other. On the other hand it is liable to prove a dangerous weapon to the user. The horn on which the antagonist is *not* transfixed may transfix himself. This has already been briefly pointed out (§ 168).

§ 975. The method of *rebutting* a dilemma is usually this. It has been argued that if Aeschines joined in the public rejoicings he was inconsistent; if he did not join he was unpatriotic. Therefore he must have been either inconsistent or unpatriotic. Or, contrariwise, if Aeschines was consistent he refused to join in the rejoicings; if he was patriotic he did join in them. But either he joined or refused to join. It follows that he was either not consistent or not patriotic.

To which it might be replied: If Aeschines joined in the rejoicings he was not unpatriotic. If he did not join he was not inconsistent. Either then he is clear of the charge of unpatriotic, or of that of inconsistent, conduct. Or contrariwise, if Aeschines was unpatriotic he refused to join; if he was inconsistent he did join. But he cannot both have joined and

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[1] If A is B it is either C or D or E. But it is not C and not D. Then it must be E. So the Wykehamist is given his choice—*Aut disce, aut discede. Manet sors tertia—caedi.*

not joined. Therefore either he was not unpatriotic or not inconsistent.

(i)

Dilemma.	*Rebutter.*
$\begin{cases} \text{If } A \text{ is } B \text{ it is } C \\ \text{If } A \text{ is not } B \text{ it is } D \end{cases}$	$\begin{cases} \text{If } A \text{ is not } B \text{ it is not } C \\ \text{If } A \text{ is } B \text{ it is, not } D \end{cases}$
A is either B or not B	A is either not B or B
Then A is either C or D.	Then A is either not C or not D.

(ii)

$\begin{cases} \text{If } A \text{ is not } C \text{ it is not } B \\ \text{If } A \text{ is not } D \text{ it is } B \end{cases}$ If A is C (not not-C) it is B

If A is D (not not-D) it is not B

A is either not not-B or not B (*modus tollens*) A is either not B or not not-B

Then A is either not not-C or not not-D Then A is either not C or not D.

i. e. A is either C or D.

§ 976. On the other hand this rebutter has a grave weakness. The rebutting syllogism is formally valid, but the conclusion which it establishes contradicts that of the original argument in appearance only. Its assumptions also halt. We cannot say in (i) that, because if A is B it is C, if A is not B it is not C; or, because if A is not B it is D, if A is B it is not D. Sublation of antecedent does not involve sublation of consequent. The rebutter of (ii) has the same defect. Nevertheless in practice it often happens that, if BA involve C, non-BA will involve non-C, and the above dilemma about Aeschines is met quite legitimately. Controversialists are often prudent in getting the other side to open fire first. To accept and rebut a dilemma is rhetorically effective. The wound received is forgotten in the counter-thrust. A point admittedly scored by the adversary is shown to lead to a consequence which he does not like. He cannot have it both ways. In arguing about ecclesiastical revenues it has often been alleged that they were given only half voluntarily for securing private masses for departed souls. The defender affects to grant this, and adds, 'Then they were not, as you say at other times, given to the nation for public purposes.' But to establish this without agreeing to the other proposition the defender has to find arguments elsewhere. Otherwise he only proves inconsistency in the assailant.

§ 977. The dilemma between Protagoras and Euathlus may find a place here. The former undertook to teach the latter the art of pleading, and payment was to be by results. When Euathlus won his first cause he was to pay Protagoras an honorarium. It happened, however, that he disliked the dusty atmosphere of the law, and cheated Protagoras of his fee by refusing to become a pleader. Whereupon Protagoras sued him, considering that should the Court award the money to himself it would be his; while even if the Court gave a verdict for Euathlus he would still have the money, which Euathlus would then be bound to pay to him in virtue of the agreement. He triumphantly told Euathlus that he would have to pay in either case. But Euathlus said, No. If I win this cause, the judges will have decided that I need not pay the money. If I lose it I shall have no obligation under our agreement to pay.

The weakness of Euathlus' defence seems to be that the loss of his cause did not place him under an obligation not to pay; and the Court would then have decided that he must pay. On the other hand, if he won it, it is true that the verdict was that nothing had occurred *up to that moment* to oblige him to pay; but the reasons for the verdict were presumably negative. His winning his cause was subsequent to those reasons, and though involved in the verdict being given was not prior to the verdict. We shall probably consider that, whichever way the Court decided, Euathlus was bound to pay, but that the verdict on the issue before the judges should have been in his favour. Protagoras could only sue him for declining to be a pleader, not for refusing to pay the money. But was there evidence that he had agreed to become a pleader?

Very similar is Chrysippus' cross-dilemma of the Crocodile and the abstracted Infant, which is too familiar to be given here.

§ 978. The dilemmatic, or hypothetico-disjunctive, judgement, as Hamilton remarks, 'cannot be analysed into an hypothetical and a disjunctive judgement. It constitutes as indivisible a unity of thought as either of these.'[1] 'If X is either Y or Z it is A' is the simplest form of the dilemmatic, as 'X is either Y or Z' is of the disjunctive judgement. The latter 'is realized by one simple energy of thought, in which the two relatives,—the *either*

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[1] *Lectures on Logic*, i. 242.

and the *or*,—are thought together as inseparable, and as binding up the opposing predicates into a single sphere.'[1]

§ 979. In what has been said above about Conditional Judgements I have refused to admit the logical distinction between Reason and Consequent, on the one hand, and any other form of general predication on the other ; or between the hypothetical proposition as a judgement about judgements and the categorical abstract proposition as a judgement about objects—the difference being one of syntax and grammatical convenience and not of logic. ' It is one thing,' remarks Professor Veitch, however, ' to say, *Lying is dishonourable* ; it is quite another to say, *If this man lies, he dishonours himself.* In the former case we affirm an attribute of a subject ; in the latter we do not properly affirm, but state a supposition or sequence following the realization of a definite hypothesis.'[2] I have shown that the only difference between such an hypothetical judgement (' If this man lies he acts dishonourably ') and a categorical judgement (' Lying is dishonourable ' = If men lie they act dishonourably) is that the hypothesis is about an actual existence—'this man '—and ' If this *A* is *B* it is *C* ' therefore cannot grammatically be thrown into the form, 'All *BA*'s are *C*.' But an hypothesis about a concrete individual or an immediate case is nevertheless just as abstract as any other.[3] ' If you stole the cup I must punish you. I find you did steal it (*assertio conditionis*). I must

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[1] Krug, quoted by Hamilton (op. cit. i. 241). He adds : ' In consequence of this, a disjunctive proposition cannot be converted into a categorical. For in a categorical judgement a single predicate is simply affirmed or denied of a subject ; whereas in a disjunctive judgement there is neither affirmation nor negation, but the opposition of certain attributes in relation to a certain subject constitutes the thought. . . . The disjunctive judgement is one essentially different from the categorical' (*Logik*, pp. 170, 171). But a disjunction is merely a categorical proposition with a negatively determined subject. 'Every *X* is either *Y* or *Z* ' may, as we have seen, be written ' Every non-*YX* is *ZX* ', which is the same judgement, realized by the same energy of thought, as ' Every non-*ZX* is *YX* '. ' Victory or Westminster Abbey ' means ' If we do not gain the victory, at least we shall have a grave among heroes '—which is the categorical judgement—' Failure to conquer involves at least a hero's grave.'

[2] *Institutes of Logic*, p. 271.

[3] Mansel asserts that ' the only hypothetical judgement which can be employed as the real major premise of a syllogism may be expressed in the form, " If any *A* is *B*, it is *C*," where *A*, *B*, and *C* represent concepts or general notions' (*Prol. Logica*, p. 218). I cannot follow this usually

therefore punish you (*assertio conditionati*).' There is no logical difference between such a major premiss and one like 'Godliness with contentment is great gain'. 'You take my life when you do take my name' is as abstract as 'Thieves never prosper' or 'Diamond cut diamond'.

Frequently a proposition is explicated not only in hypothetical form but in conditional grammatical mood in order to suggest non-fulfilment of the condition; as in Pascal's apophthegm—'If all men knew what is said behind their backs there would not be two friends in the world'. The assumed existence of friendship (*sumptio dati*) proves that men do not know what is said of them. Cf. 'si amitti beata vita potest, beata esse non potest' (Cic.). Or in the fourth *Georgic*—'ignoscenda quidem scirent si ignoscere Manes'. They never forgive, it is implied, and therefore Orpheus' madness in looking back at Eurydice was unforgivable—where sublation of the antecedent involves, for once, denial of the consequent, the reasoning being of the form, 'If any *A* is *B this A* is *B*. No *A* is *B*. Then this *A* is not.' Usually, as we have seen, when the verb is in the conditional pluperfect, it is suggested that sublation of the antecedent involves denial of the consequent—'If *A* had been *B*, *C* would have been *D*'. In other words, the condition is here a *conditio sine qua non*.

§ 980. Every *BA* is *C* = Every *BA because* it is *B* is *C* = Every *A if* it is *B* is *C* = If it is true that if a thing is *A* it is *B*, in that case it is *C*. Similarly, Every *BA* is *DC* = If it is true

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lucid writer's distinction between the two meanings of 'If Caius is free from business he is writing poetry', which means either, generally, 'Whenever Caius is disengaged he writes poetry,' or, specially, 'If he is now disengaged he is writing poetry.' The former, he says, yields a conclusion *ex hypothesi*. In the latter case the inference is made not from the hypothesis but materially from some circumstance known to the reasoner, but not appearing in the proposition. 'Any one being asked, "Why do you infer that Caius, being now disengaged, is writing poetry?" would reply, "Because he told me he should do so," or something of the kind' (*Proleg. Logica*, p. 217 n.). But what did he tell him? That he would be writing poetry at a certain hour? No; but that if he were at some particular moment found disengaged, it might be presumed that he was writing poetry. The two meanings of the original proposition are both abstract. But the former means, 'All the *cases* of Caius being disengaged are cases,' &c.; the latter means, 'All the present *possibilities*, or *contingencies*,' &c.

that if a thing is A it is B, in that case it is true that if a thing is C it is D. An abstract categorical proposition is then seen to be an hypothesis about an hypothesis. It is a problematic synthesis. The supposition that the supposition of A involves the assertion of B involves the assertion that the supposition of C involves the assertion of D. Thus, 'Ill weeds grow apace.' The supposition of anything which is a weed being an ill one involves the assertion that whatever growth it has is a quick growth. 'Evil communications corrupt good manners.' The supposition of any communications that exist being evil ones involves the assertion that any good manners that exist will be corrupted. In sublating the consequent (predicate), however, we must not say 'does not involve' but 'excludes'. The supposition of the supposition of C excluding the assertion of D involves the assertion that the supposition of A excludes the assertion of B.

§ 981. Mansel rightly says :—' The distinction so much insisted on by the Kantians of the *problematical* character of the two members of an hypothetical judgment is, like the whole Kantian doctrine of modality, of no consequence in formal Logic. All formal thinking is, as regards the material character of its objects, problematical only.'[1] Sigwart observes :—' The necessity of each particular phenomenon is never more than a conditioned necessity, an ἀνάγκη ἐξ ὑποθέσεως. When something is said to be necessary, it is not the cause, but the fact that it results from the causes present, which is called necessary.'[2]

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[1] *Proleg. Logica,* p. 214, and *Aldrich,* p. 234.   [2] *Logic,* p. 200.

CHAPTER XXIX

ATTACKS ON THE SYLLOGISM

§ 982. To the reader of the foregoing pages it may now be left to say whether Syllogistic Reasoning can be superseded, or admit a rival. A modern school of writers, however, who are metaphysicians rather than logicians, have challenged the Syllogism's indefeasible claim by what is very like a reckless and unscientific appeal to a common jury, relying upon the complexity and subtlety of thought and language—to which 'traditional' logicians have certainly paid too little attention—for a triumphant disproof of the syllogistic laws. In England the leaders of this destructive and sans-culottist school have been Dr. Bosanquet and Dr. Bradley. The former says—

'There is no such thing as an antecedent scheme prescribing, so to speak, a set of schedules in one or other of which every argument can be written out merely by filling in the blanks. The form of knowledge is an active and constructive principle, to the workings of which no abstract type, antecedently applied, can be adequate. Logic is incapable of prescribing beforehand the type of relations which an inferential totality may impose upon its parts.'

He speaks of

'the difficulty of moulding the vital and constructive action of thought into shapes prescribed by an artificial scheme which does not precisely correspond to any single type of intellectual action. The violent transformations by which formal logic attains this end are not perhaps an undesirable scholastic exercise; for they unquestionably drag into light, though only as a meagre and skeleton framework, a certain ultimate community and type in all inferential operations.' [1]

But he will only hesitatingly allow us to say that 'in the common nature of thought a system of conditions can be discovered which in one way or another is conformed to by every act of inference'. [2]

§ 983. Inasmuch as the end and aim of Logic is to detect the

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[1] *Logic*, ii. 197, 198.   [2] Ibid. p. 199.

unity of reasoning, that which gives to one and all inferences their validity and compulsiveness, the assertion that no abstract and universal type can be found is an assertion that Logic is a failure, that there is no One in the Many, and that the form of Reason varies with its matter. Nevertheless 'a certain ultimate community and type' is conceded. But it is disparaged as a meagre and skeleton framework—as though form could be anything else. It is a 'system of conditions', which, however, are only approximately laws. Every inference must have three terms and no more, and two premisses possessing an identical term in common, which must be universal, 'for a universal is that which without prejudice to its identity persists through, or contains in itself, different relations.' Yet there is 'no justification for the traditional pre-eminence assigned to one premiss as the "major"'. Such a pre-eminence is bound up with 'the vicious quantitative form of the universal, and carries with it the *petitio principii* which has been irresistibly demonstrated to be present in the traditional syllogism'. Further, there is 'no justification for the distinction between universal and particular premisses'. Both must really be universal (apparently as both sides of an equation are totals), and, 'if negation implies significant denial only, both may be negative.'[1] All M is non-P, all M is non-S. Non-S (the absence of S) and non-P (the absence of P) are therefore sometimes found in combination. This is, I imagine, Dr. Bosanquet's meaning. Bare denial, he says, is no judgement, and therefore both premisses are thought as positive.

§ 984. The old logicians certainly employed a narrow range of illustration, and regarded reasoning too exclusively in its aspect of subordinating one class to another class, species to genus. The objection to the premiss which states the rule being called the 'major' is, however, trivial. The criticism of 'All A is B' as a vicious formula of universality, inasmuch as it 'excludes such vital and genuine processes as, e. g., modal conversion,' has been shown above to be ill-founded. Generally, Dr. Bosanquet contends, 'The traditional syllogism is a hybrid between analogical inference and inference or induction by complete enumeration.' He says it excludes calculation and geometrical construction, and has no place for Induction, for Analogy, or for philosophical subsumption. In short, it 'fails

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[1] *Logic*, ii. 202.

to recognize the synthetic activity of thought'. For example, having asserted that 'the mind is a unity of determinate and not exclusive parts', we could not, he says, go on to say, 'A feeling is the mind, and therefore A feeling is a unity,' &c. We could only say that a feeling is a *factor* or *element* in such a unity.

§ 985. Thought undoubtedly is manifold. But Reason is one. The whole object of Logic is, after analysing the synthetic activity of thought, to exhibit the single 'form' underlying its rational connexions. What are we offered instead of the 'traditional syllogism' of subsumption under rule ? 'Syllogism is a subsumptive reasoned judgement, depending upon the unity of differences within an individual subject, and making the intelligible ground of this unity explicit in various degrees.'[1] This, if I understand it aright, seems to be only the 'traditional' idea of inference in a more abstruse form, with a leaning however to the Third Figure, and in it to *Darapti* as the norm of reasoning. A subject combines in itself two distinct characteristics, which are therefore shown to have a possibility of combination, so far as their union has an intelligible ground in the subject or middle term. In another place the same talented writer observes : 'If the present reaction against formal logic should end in establishing a more vital conception of universality than that which sets it down to mere abstraction, a fundamental reform will have been made in philosophic first principles.'[2]

§ 986. Turning to Dr. Bradley, we have an indictment of the Syllogism which would be more appropriately called scolding. We are witnessing, it seems, 'the dying effort of a hard-run and wellnigh spent chimera' which has deluded mankind for some two thousand years. The time has come when such truth as it contained should be disengaged from it and be able to stand by itself.

'We cannot for ever with eyes fast closed swallow down the mass of orthodox rubbish in which that truth has wrapped itself up.' 'The first to go must be the major premise. . . . An effete superstition is doomed. Begotten by an old metaphysical blunder, nourished by a senseless choice of examples, fostered by the stupid conservatism of logicians, and protected by the impotence of younger rivals, this chimera has had a good deal more than its day. Really dead long since, I can hardly believe that it stands out for more than decent burial. . . . The major

[1] *Logic*, ii. 203.   [2] Ibid. i. 63.

premise is a delusion, and the syllogism itself, like the major premise, is a mere superstition. . . . It professes to be the model of reasoning, and there are reasonings which cannot by any fair means be conformed to it.'

§ 987. The axiom of inclusion within class extension, Dr. Bradley continues, gives no new information and involves *petitio principii*. It is therefore vicious. The axiom too of Kant —' What stands under the condition of a rule stands under the rule '—applies only to the category of subject and attribute, and fails whenever you pass beyond. Even in that category it is a mistake, as the Third Figure shows, to insist on the necessity of a major premiss.

§ 988. The following ' palpable inferences ' are adduced as indefensible on the principles of the ordinary Syllogism :—

(i) A is to the right of B, B is to the right of C, therefore A is to the right of C. (ii) A is due north of B, B due west of C, therefore A is north-west of C. (iii) A is equal to (greater or less than) B, B is equal to (greater or less than) C, therefore A is equal to (greater or less than) C. (iv) A is in tune with B and B with C, therefore A with C. (v) A is prior to (after, simultaneous with) B, B to C, therefore A to C. (vi) Heat lengthens the pendulum, what lengthens the pendulum makes it go slower, therefore heat makes it go slower. (vii) Charles I was a king ; he was beheaded, and so a king may be beheaded.

In (vi) and in (vii), Dr. Bradley observes, ' our old friend the major premise ' is scarcely distinguishable from the minor. (vii) is *Darapti*, but (vi) is *Barbara*, and there can be no question which is major premiss and which minor. 'In all the rest he has totally vanished.' ' Logical necessity does not always come from the application of universals to something *less* universal. But if so there need not be always a major, and the [above] examples put this beyond a doubt.'

Let me suggest one or two more. A is the friend of B ; B is the friend of C. Then A is the friend of C.—A is thrice as large as B ; B is thrice as large as C. Then A is thrice as large as C.—A is B's grandfather ; B is C's grandfather. Then A is C's grandfather.—A is next to B; B is next to C. Then A is next to C. The reader can compose thousands of such 'palpable inferences ' for himself.

§ 989. Inasmuch as major premiss is only another name for

the rule or principle on which the conclusion rests, being applied
through the minor premiss to some case or other, what we are
asked here to admit is that a reasoning can take place without
any reason, dispensing with ground, with rule, and with appli-
cation.   If the minor premiss applies anything, what is it?   A
ground is necessarily a universal.   *On what ground* are we to
infer that, when A is to the right of B and B to the right of C, A
is to the right of C?   It is easy to ridicule the proposed major
premiss, 'Whatever is to the right of a thing which is to the
right of some other thing is itself to the right of that other thing,'
just as it would be easy to ridicule the imposing and highly
complex amplifications of one or two simple axioms in De
Moivre's Theorem or one of Euclid's more elaborate con-
structions.   But we are offered nothing to take its place.[1]   Dr.
Bradley thinks it enough to say:—'If such reasoning is reason-
ing *from* an axiom, how did people reason before axioms were
invented?'   Which is like asking, How did people count before
arithmetic was invented? or, Who wrote the first book to teach
reading?   From 'A is like B and B is like C', we cannot,
as he himself says, infer certainly a likeness between A and C.
Nor, because A is worth five times as much as B, and B five
times as much as C, can we infer that A is worth five times as
much as C.   But why?   Because there is no general axiom
which would necessitate that inference.

§ 990. Dr. Bradley says:—

'From such premises as "A is to the right of B and B to the
right of C" there is and can be no form of reasoning which will
give you the conclusion. . . . Where the inference is valid, the
special operation by which it is performed falls outside the
axiom, and it is impossible therefore that the axiom can supply

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[1] 'Bradley confuses two different operations, inference and observation.
When there is inference there is a major premiss, which may be un-
expressed or cumbrous, but is required for the thought.   As Aristotle
puts it, the syllogism is directed "not to the outer but to the inner
discourse", or as we should say, not to the expression but to the thought'
(Case, *Encycl. Britt.*, tenth edition, Article 'Logic').   Professor Case,
however, concedes (contrary to the view taken in this book) that 'there
are inferences which are not syllogisms'.   He observes in another passage
that 'the Logic of the last quarter of the nineteenth century may be said
to be animated by a spirit of inquiry marred by a love of paradox and
a corresponding hatred of tradition.   But we have found, on the whole,
that logical tradition rises superior to logical innovation.'

any test of validity. . . . The actual operation is not a matter for superior direction; it is a matter for private inspiration and insight. It is impossible that there should be fixed models for reasoning; you cannot draw out exhaustive *schemata* of valid inference. There are principles which are tests of the general possibility of making a construction: but of the actual construction there can be no canons. The attempt to manufacture them would lead to the search for a completed infinity; for the number of special relations has no end, and the possible connexions in time, space, and degree are indefinite and inexhaustible. To find the canons of valid inference you must first make a list of valid inferences.'

§ 991. This is mere nihilism. Of course Logic cannot supply major premisses. What is meant by 'valid inferences'? Do we measure the relative positions of A, B and C by compass and rule, and find it true that A *is* to the right of C? But, then, this is not an inference. The premisses said that A was to the right of C *because* it was to the right of B. Shall we substitute 'proposition' for 'inference'? When A is to the right of B and B to the right of C, measurement or inspection shows us that A is always found to the right of C. That proposition then is valid. But why 'valid'? Should we not rather say 'corresponds with facts'? It is the *validity* of *inference* which logic analyses, not the contingent truth of propositions. The logician, Bradley says, is thought to be a spiritual Director who does not supply arguments but tests them. The logician, however, tests them as *reasoning*, but stripped of everything material, even of language, except as *given*. He knows nothing about right and left, north and west, about tuning-forks or pendulums. Priority, equality, posteriority, inferiority, belong to the concrete matter of the reasoning.

§ 992. Dr. Bradley confuses Thought with Reason, and because the categories of thinking are many he denies that the form of ratiocination can be one. He draws up a dialectical Declaration of Independence, or rather of Antinomianism. All inferences are in future to be equal and free, emancipated from rule and domination. He is at once the Robespierre and the Luther of logic. 'The syllogism is effete and its realm is masterless; and the question for us who aspire to the inheritance is to know in what character we mean to succeed. Do we wish to substitute one despotism for another? Are our principles of inference to be tests and canons? Most assuredly not.' As

a 'staunch Protestant' he upholds the liberty of private judge-
ment, and refuses to submit the validity of an argument to
Aristotle or any one else.   That one premiss should be called
' greater' and the other 'less', in a free country, is a piece of
aristocratic pretension which is especially odious.   But stay.   By
stepping down from its high seat and consenting to an equality
with, or even inferiority to, the minor premiss, the major premiss
may just ' save the syllogism '.   ' The one chance there is of pre-
serving the syllogism is for us to take our stand upon the third
figure.   " The attributes of one subject are interrelated " will
then become the axiom of inference.'   Certainly Figure III is
the figure in which it is most difficult to detect the dominate law.
Major and minor lie more or less cheek by jowl.   The minor's
badge of servitude has there almost vanished.   It is true that this
figure never yields a conclusion which is universally true.   But the
New Logic has no need of universals or of dominant laws.   All
judgement will be an equation, an extensional identification, and
subordination of concepts will be but a humiliating memory of
the past.   So Dr. Bradley plants a tree of Liberty on the grave of
the Syllogism, and Figure III becomes a kind of sacred *Tiers État*.

§ 993.   All that is needed is a point of connexion between the
premisses.   Inference is a synthesis, a combination of *data*,
which results in the perception of a new relation within that
unity.   ' The process is a construction and the result an intui-
tion.   But this construction must not be arbitrary.   There
must be " the identity of a common link ". $A = B, B = C$
become a single whole, $A = B = C$, from which ' we proceed to
our conclusion by mere inspection, $A = C$.   " Man is mortal and
Caesar is man and therefore Caesar is mortal."   There is first
a construction as Caesar—man—mortal, and then by inspection
we get Caesar—mortal.   It is useless to lay down rules for either
part of this process.   It is the man who perceives the points of
union within his premisses—who can put (as the saying is) two
and two together,—who is able to reason.'

§ 994.   It is to achieve this crude and trivial result that Aris-
totle is put into the dock, and rated and cross-examined in what
I must be pardoned for calling an Old Bailey style of jaunty
menace.   Certainly the reasoner may expect harder nuts to crack
than Caesar—man—mortal.   He is warned to secure 'the unity of
his construction ', for which ' no models can possibly be invented.

And for the process of inspection one wants a good eye; for there are no rules which can tell you what to perceive.' The art of perceiving, however, is entirely outside the province of Logic. The logician does supply models for the reasoning process, and that is all that concerns him. He insists, for instance, that the middle term shall be not merely a point of contact,—otherwise '*A* is *C*, *B* is *C*' would yield a conclusion,— but a real keystone to the arch. No inference is warranted by, '*A* is half of *B*, Half of *B* is *C*.' Spencer's 'Things related to the same are related to each other' is therefore an unsatisfactory rule. The ordinary rule against *quaternio terminorum* Dr. Bradley repudiates. The limit to the number of terms 'is psychological and is not logical'. Yet 'it is true, no doubt, that in making a construction we are forced to establish one link at a time'. Logicians usually call this the Sorites.

§ 995. The endeavour to substitute a rule of thumb for science in reasoning has an earlier champion of another kind in Mill, who pleads that we can and do reason from particular to particular without passing through a universal. It is astonishing that a writer who did so much to place Induction upon its true basis, that of causal connexion, should lead a crusade against major premisses. For what is the statement of a cause but a major premiss? And what are the Five Canons but highest and most universal axioms? Mill's own tendencies, no doubt, are nominalistic. He is bent on disparaging universals and deductive inference. But this is to saw off the branch on which he is sitting.

§ 996. According to Mill, then, 'the Syllogism is not the form in which we necessarily reason, but a test of reasoning, a form into which we may translate any reasoning with the effect of exposing all the points at which any unwarranted inference can have got in.'[1] It is 'an artificial formula', not the way in which we do necessarily reason, but a type to which all reasonings ought to be able to conform under pain of being pronounced invalid. It is not a 'correct analysis of what the mind actually performs in discovering and proving the larger half of the truths, whether of science or of daily life, which we believe'.[2] On the other hand it is not merely useless and frivolous. One might borrow the language of theologians and say that in Mill's view Syllogism is not of the *esse* but of the *bene esse* of Inference.

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[1] *On Hamilton*, pp. 503, 504.   [2] *Logic*, i. 209.

§ 997. The word 'discovering' in the foregoing sentence confuses the question at the very outset. But let us leave this till we come to Induction. Mill next says that the doctrine that in every syllogism there is a *petitio principii* appears to be 'irrefragable'. For a conclusion can state nothing more than has been already stated in the premisses. Certainly. But it states more than is in either premiss separately (see below, § 1019), and there is no begging of a question unless the point to be proved be implied in one premiss. Mill, however, immediately slips into the assumption that because a conclusion has been already ' asserted in the premisses ' it has been already asserted in the major premiss—which is like saying that if a man inherited all he possesses from an uncle and a cousin, he inherited it all from the uncle, and also all from the cousin. But to come to closer quarters with Mill's view of the syllogism. The following are the familiar paragraphs :—

§ 998. ' Assuming that the proposition, The Duke of Wellington is mortal, is immediately an inference from the proposition, All men are mortal, whence do we derive our knowledge of that general truth ? Of course from observation. Now all which man can observe are individual cases. From these all general truths must be drawn, and into these they may be again resolved ; for a general truth is but an aggregate of particular truths ; a comprehensive expression, by which an indefinite number of individuals are affirmed or denied at once. But a general proposition is not merely a compendious form for recording and preserving in the memory a number of particular facts, all of which have been observed. Generalization is not a process of mere naming, it is also a process of inference. From instances which we have observed, we feel warranted in concluding that what we found true in those instances holds in all similar ones, past, present, and future, however numerous they may be. . . .

' When, therefore, we conclude from the death of John and Thomas, and every other person we ever heard of in whose case the experiment had been fairly tried, that the Duke of Wellington is mortal like the rest, we may, indeed, pass through the generalization, All men are mortal, as an intermediate stage ; but it is not in the latter half of the process, the descent from all men to the Duke of Wellington, that the *inference* resides. The inference is finished when we have asserted that all men are mortal. What remains to be performed afterwards is merely deciphering our own notes.

' Archbishop Whately has contended that syllogizing, or reasoning from generals to particulars, is not, agreeably to the

vulgar idea, a peculiar *mode* of reasoning, but the philosophical analysis of *the* mode in which all men reason, and must do so if they reason at all. With the deference due to so high an authority, I cannot help thinking that the vulgar notion is, in this case, the more correct. If from our experience of John, Thomas, &c., who once were living, but are now dead, we are entitled to conclude that all human beings are mortal, we might surely have concluded at once from those instances that the Duke of Wellington is mortal. The mortality of John, Thomas, and others is, after all, the whole evidence we have for the mortality of the Duke of Wellington. Not one iota is added to the proof by interpolating a general proposition. Since the individual cases are all the evidence we can possess, evidence which no logical form into which we choose to throw it can make greater than it is; and since that evidence is either sufficient in itself, or, if insufficient for the one purpose, cannot be sufficient for the other; I am unable to see why we should be forbidden to take the shortest cut from these sufficient premises to the conclusion, and constrained to travel the "high priori road" by the arbitrary fiat of logicians. I cannot perceive why it should be impossible to journey from one place to another unless we "march up a hill and then march down again". It may be the safest road, and there may be a resting-place at the top of the hill, affording a commanding view of the surrounding country; but, for the mere purpose of arriving at our journey's end, our taking that road is perfectly optional; it is a question of time, trouble, and danger.'[1]

§ 999. The confusion of thought in this celebrated passage has been so often exposed that I attempt its refutation once more for the sake only of the inexperienced student. We may pass (by a lucky shot) from particulars to particulars, but we cannot *reason* directly from particulars to particulars. A reason is essentially a universal—using that expression in its widest sense. There must be some mediation, if there is to be proof. There must be a one in the many when we are arguing from eleven individuals to a twelfth. Mill maintains that from our experience of John, Thomas, and others dying we could 'conclude at once from those instances that the Duke of Wellington is mortal'. On what ground? On the ground that he resembles them? Resembles them in what? In wearing a cocked hat, in being under a certain height, in being Irish, in having two feet, or in any other such way? Of course not, but in being a man, or

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[1] *Logic*, i. 213–15.

[2] Ἐὰν τὸ καθόλου μὴ ᾖ, τὸ μέσον οὐκ ἔσται, ὥστ' οὐδ' ἀπόδειξις (Ar. *An. Post.* i. 11, 77ᵃ7).

a terrestrial living creature, or, if you like, in having a certain physical constitution.   As Bosanquet says, ' Particulars must have some element of unity, for inference to take place.   From "*a, b, c, d* are good books" to "*e* is a good book" no sort of inference holds or is in any way suggested.   But from "*Ivanhoe, Waverley* and *Rob Roy* are good books" to "*Guy Mannering* is a good book" there is a self-evident passage by means of the identity of authorship, which is too obvious to be expressed.'   If after all we think the *Surgeon's Daughter* not to be a good book, it is because our induction was rather hastily expressed.   The cause of *Ivanhoe* and the others being good books was not simply that Sir Walter Scott wrote them, but Sir Walter under a certain inspiration or in certain circumstances, which were not always present when he wrote.

§ 1000. The point then in which we consider that (let us say) the present Pope resembles all other beings whom death has over-taken, and which leads us to infer that he too will die, is the ground or reason for that inference.   We cannot pass from them to him except through that ground.   Our confidence must be based on something.   That something, then, in any rational and orderly argument must be explicitly stated.   And it must appear twice in the argument.   These two appearances are the major and minor premisses.   It is not the 'arbitrary fiat of logicians' which requires this.   It is because no other method of inference can be conceived or has ever been propounded.   Dr. Bradley, as we saw, girds at the necessity for major premisses and at the explicit syllogism—which is like railing at the multiplication table.   But he too falls out with Mill, and shows that, if a dog's wagging of its tail is a sign of pleasure, the child who hastily concludes the same of the cat goes on an erroneous analogy. It argues from particular to particular, from fact to fact, but unscientifically.   It does indeed mount that hill which Mill considers so superfluous, but it mounts it too hastily, and so descends the other side too precipitately.   It is not always wrong to generalize from a single occurrence ; but for most conclusions a patient induction is required.   We cannot argue from Mon-mouth to Macedon or from chalk to cheese because they have something in common.   As logicians, however, we are not at present concerned with the goodness or badness of our major premisses.   They may be the result of an induction which we

have framed, or they may have been acquired from others, or obtained in some other way. But all inference is the application of a major premiss to this or that subject.

§ 1001. It is this application which the school of Mill deny.[1] Their polemic is really less against major than against minor premisses. They admit that a general rule stands in the background of any reasoning, but they say it need not be appealed to; that the conclusion exists by no grace of that general rule. It is independent of any major premiss. It has been created in the same way in which the universal has been created; and in inferring from my experience, e. g. of pensioners, that they are practically immortal, I, by the same, and not a subsequent, act of thought infer that the poor relation whom I have just pensioned will live to an enormous age. Or rather, if 'a general truth is but an aggregate of particular truths', the particular inference is really prior to the generalization. A general truth may, Mill says, be 'resolved' into the individual cases of which it is a compendious expression. It is 'a contrivance of language which enables us to speak of many as if they were one'. He who admits the major premiss asserts the conclusion.

'The Duke of Wellington is mortal like the rest.' It is strange that Mill should have ignored the significance of *like the rest*. The Duke was mortal like the rest because he was like the rest in those attributes of which mortality is the effect. The belief that mortality is the effect of those attributes (major premiss), and that the Duke possessed them (minor), necessarily preceded the conclusion that he was mortal. 'The inference,' writes Mill, 'is finished when we have asserted that all men are mortal.' Why, then, preface the particular conclusion with a *therefore*? The Disciples who believed that St. John would not die were conscious, not merely that in this he would be

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[1] 'Mr. Mill's defence of the Syllogism in fact amounts to an abandonment of all formal reasoning. All reasoning, he tells us, is really from particulars to particulars. But, in that case, all inference must depend upon the matter, and cannot be reduced to any general type. If, for example, I conclude that a man now living is mortal, solely from the premises, "*A, B*, and *C*, who are dead, were mortal, and this man resembles them in certain other attributes of humanity," I may, by an argument of precisely the same *form*, prove any given man to be six feet high, because *A, B*, and *C*, whom he resembles in the common attributes of humanity, were all of that stature' (Mansel's *Aldrich*, p. 201).

unlike others whom they had known to pass out of life, but that his case would be an exception to a rule embracing mankind generally.

§ 1002. The demonstration of the properties of a circle represented by a diagram is, Mill maintains, only true of that particular circle *ABC*. Yet he goes on :—

'One instance only is demonstrated. But the process by which this is done is a process which, when we consider its nature, we perceive might be exactly copied in an indefinite number of other instances; in every instance which conforms to certain conditions. . . . If we can prove an individual conclusion by assuming an individual fact, then, in whatever case we are warranted in making an exactly similar assumption, we may draw an exactly similar conclusion. . . . The proof does not rest on the general assumption, but on a similar assumption confined to the particular case : that case, however, being chosen as a specimen or paradigm of the whole class of cases included in the theorem, there can be no ground for making the assumption in that case which does not exist in every other; and to deny the assumption as a general truth is to deny the right of making it in the particular instance.'[1]

It is exactly this possibility of standing as a representative type of all instances that conform to the same conditions which constitutes abstract thought. We argue, as Bradley says, not from the particularity of the image of a past occurrence but 'from the content, the idea which can exist in different times and under diverse conditions'.[2] But no. Mill goes on :—

'All inference is from particulars to particulars. General propositions are merely registers of such inferences already made, and short formulae for making more. The major premise of a syllogism, consequently, is a formula of this description : and the conclusion is not an inference drawn *from* the formula, but an inference drawn *according to* the formula : the real logical antecedent, or premise, being the particular facts from which the general proposition was collected by induction. These facts may have been forgotten : but a record remains. According to the indication of this record we draw our conclusion : which is,

[1] Op. cit. p. 220.

[2] *Logic*, p. 324. Again, 'You never can say "*B* follows from *A*", " is because of *A*," " must be, given *A*," unless *A* is present in a determinate form. *A* must be a content without any mixture of sensuous conditions. It must be ideal, abstract, and so universal. The "because" cannot couple anything but universals' (p. 220). 'To reason directly from particulars to particulars is wholly impossible' (p. 322). But Bradley dispenses with the syllogistic bridge.

to all intents and purposes, a conclusion from the forgotten facts. For this it is necessary that we should read the record correctly : and the rules of the syllogism are a set of precautions to ensure our doing so. They are " a collateral security ".' [1]

§ 1003. So that if a schoolboy reads a notice that Trespassers will be prosecuted, and finds himself on the forbidden side of the hedge, the conclusion which he draws, that should the constable or owner appear he will be prosecuted, is not an inference from these considerations but is an inference from the various facts which led to the notice being put up. Or, if he sees a board with ' Dangerous ' on it and comes to the conclusion that he had better not bathe there, this conclusion, according to Mill, is really drawn from the cases of drowning which had taken place at that spot—though he may never have heard of them. It is true that these accidents effectuated the putting up of the board. The Conservancy had them in its mind when it placed it there, and the boy knows vaguely that the Conservancy had something in its mind. But to say that the boy's conclusion has those fatalities for its premisses is to confuse material conditions with formal. It does not escape Mill that generalization may take the form of a command.

'So far as this asserts a fact, namely a volition of the legislator, that fact is an individual fact, and the proposition, therefore, is not a general proposition. But the description therein contained of the conduct which it is the will of the legislator that his subjects should observe is general . . . The only point to be determined is whether the authority which declared the general proposition intended to include this case in it.'

We are to ascertain whether the case possesses the marks common to those cases which the legislator certainly had in mind. 'The operation is not a process of inference but a process of interpretation.' Now this is the minor premiss reinstated under the grander name of 'hermeneutics'. I am to take no notice of 'Wait till the train stops' or 'Beware of the dog' till I am satisfied, not that the warning is a general one, addressed to me as well as others, but that my circumstances resemble those of various people who have sprained an ankle or been bitten. But then, being thus satisfied of the resemblance, am I not now a law and a major premiss to myself?

[1] Op. cit. p. 221.

Resemblance may be material or immaterial. If the former, the recognition of it is *eo ipso* a general truth. 'Whenever,' writes Mill, 'we can legitimately draw any inference we may legitimately make our inference a general one.' 'The advantage of referring to a parallel case is universally acknowledged.' But real parallelism, being abstracted from the merely contingent features of the two or more cases, itself constitutes a law, a reason, a universal. The consciousness of the parallelism is indispensable to any inference. But Mill declares on the contrary that 'the major is no real part of the argument, but an intermediate halting-place for the mind, interposed by an artifice of language between the real premises and the conclusion by way of a security'.[1] The 'general proposition is a security for good reasoning, not a condition of all reasoning, and in some cases not even a security'.[2]

§ 1004. For our most familiar inferences, he urges, 'are all made before we learn the use of general propositions, and a person of untutored sagacity will skilfully apply his acquired experience to adjacent cases, though he would bungle grievously in fixing the limits of the appropriate general theorem.' The savage executes unerringly the exact throw which brings down his game. The experienced dyer mixes the ingredients by a kind of acquired insight, but cannot explain how he does it. The village dame physics a neighbour's child with the camomile which did her Lucy good when her symptoms were the same. Nay, 'we all, where we have no definite maxims to steer by, guide ourselves in the same way.' Even responsible administrators have thought it true wisdom to give their decisions boldly without assigning reasons, for, as Lord Mansfield said, the former might be right, but the latter would probably be wrong.

§ 1005. Such a plea for empiricism, based on the limitation of human faculties, assumes that the major premiss in reasoning must be consciously and verbally before the mind if it is in the mind at all. The savage who hurls the boomerang so adroitly 'owes this power to a long series of previous experiments, the results of which he certainly never framed into any verbal theorems or rules'. The dyer 'had from the individual cases of his own experience, established a connexion in his mind

[1] Op. cit. p. 230.　　　　[2] Ibid. p. 236.

between fine effects of colours and tactual perceptions in
handling his dyeing materials', but he 'could not put others
in possession of the grounds on which he proceeded from
having never generalized them in his own mind, or expressed
them in language'. 'Among the higher order of practical
intellects there have been many of whom it was remarked
how admirably they suited their means to their ends, without
being able to give any sufficient reasons for what they did ; and
applied, or seemed to apply, recondite principles which they
were wholly unable to state.' The old warrior's experience has
'left a number of vivid, unexpressed, ungeneralized analogies
in his mind, the most appropriate of which, instantly suggesting
itself, determines him to a judicious arrangement'. Aubrey
cites a saying of Hobbes that he would 'rather use an old
tender [attendant] that had many yeares been at sick people's
bedsides then the learnedst young unpractised physitian '.

§ 1006. Now this is a question to some extent, no doubt, for
the psychologist. He will explain how the human mind can
work and arrive at conclusions without being explicitly aware
of the grounds and *rationale* of the conclusions arrived at. By
what subtle touches does Experience impress her lessons on
the unreflective consciousness ? The boomerang thrower knows
nothing about parabolas, nor yet about his own muscles. The
delicate touch of the billiard champion is independent, possibly,
of any acquaintance with the laws of geometry and of elasticity.
And yet, after all, the throw, or the stroke, is governed by
universal laws, and it is in obedience, conscious or unconscious,
to those laws that the deer is felled or the red ball pocketed.
Such examples raise the question of bodily habituation as
entering into our knowledge, and large controversies suggest
themselves about mental latency, subconscious intelligence, and
the subliminal self. But at any rate, however the sleep-walker
or the dye-mixer manages to conform his actions to laws, he
does conform them. A simple case is that of the admini-
strator without legal training, or the chieftain who has never
heard of a drill-book arranging his troops after a glance at
the ground. The sensible decisions of the one and the shrewd
dispositions of the other are the outcome, Mill says, of past
experience, not of theoretical maxims. Nevertheless, if they
are *right* they must be right for some reason. The result is

in accordance with universal justice or wisdom. The fact that governor and commander arrived at the result which omniscience would have dictated must either have been a mere chance or, if not, proves them to have really apprehended the general truth, however unable they might be to realize consciously the principles on which they acted or to put them into words. Perception of the universal in the immediate and individual presentation may be quick and vivid, where nevertheless the reflective ability is confused and slow.[1]

§ 1007. But the psychological question does not go to the root of the present matter. Suppose that we really could leap immediately from particulars to a new particular without any apprehension of a ground or reason. Suppose by some pre-established harmony our minds were so constituted that one particular truth followed another in them without any, even unconsciously, perceived principle of connexion—for the perception of a principle is a generalization—, so that, knowing A to be X and B to be X, we somehow came to know C to be X. Our minds might be transported from truth to truth as the legend affirms that the angel transported Habakkuk by the hair of his head. The logician, however, will say, All this is nothing to me. I do not wish to know how you came by this conclusion as a proposition, but how you came by it as a conclusion. With its psychological history, by what cerebral process you reached it, or how you had it revealed to you, I am not concerned. All I ask is on what *ground* do you now affirm it to be true. How do you *justify* it rationally? What is your *reason* for affirming it? But a ground, a rational justification, a logical reason, is necessarily a universal. I cannot argue anything without an *argumentum*. Even if the reasoner cannot produce his reason, he knows at bottom that it is there. In that expression ' *adjacent* cases ' lies the whole question. Is the wagging of pussy's tail

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[1] That a conclusion about an individual object is essentially general is pointed out by Mill himself when describing the inductive chain of reasoning by which the Moon's distance is ascertained. Not only might a general proposition have been concluded instead of a single fact, but ' in strictness the result of the reasoning *is* a general proposition ; a theorem respecting the distance, not of the moon in particular, but of any inaccessible object ' (*Logic*, i. p. 331). In the same way the village wife knows not merely that her Lucy got well after taking camomile, but that the camomile cured her, and perception of cause is perception of a universal.

adjacent to the wagging of Carlo's? The child who, being apprised of the birth of two baby brothers, asked, Which shall you drown? supposed that the nativity of boys was adjacent to that of kittens. I knew an analogically minded child who, on emerging from his bath and not being at once dried, was apprehensive of *rusting*, and many have heard of the schoolboy who, being told that heat expands bodies and cold contracts them, suggested that that might be the explanation of summer days being long and winter days short. ' Parallel cases', which do not run on all fours but are merely adjacent, are dangerous things. Is the particular case a type, a sample? Inference ascertains the sameness of samenesses ; but are they the same ? Old birds are not caught by chaff, though in Spain and in the Campagna birds are still snared by a fowler carrying a lantern, a cattle-bell, and a small net. The sleepy fowl thinks the steps are those of a wandering cow.

§ 1008. The case of brutes and of babies is naturally relied on by Mill. Both the burnt child fears the fire and also the burnt dog.[1] How can an infant generalize? Yet it undoubtedly infers from fact to fact. ' In the same way also brutes reason. There is no ground for attributing to any of the lower animals the use of signs, of such a nature as to render general propositions possible. But those animals profit by experience.'

§ 1009. Bain observes :—

' The knowledge that guides the lower animals is unconnected with language. They observe by their senses the things about them and the observations are remembered in sensible forms. The bush that gives shelter, the herbage for food, the animals to be preyed upon, are known and sought after by the sole guidance of sense impressions.

' Human beings have numerous experiences of the same kind, involving the order of nature, without being connected with words. The child has a large stock of sense knowledge before it can understand and employ language. The skill of the artisan consists, for the largest part, in associations between sensible appearances and movements ; to the stone-polisher the sight of the surface at once suggests the next blow.

' Even in a highly intellectual profession, as the practice of physic, the consummation of skill requires a large sense knowledge, passing beyond the scope of language. The physician learns from books everything that can be expressed in words ;

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[1] *Logic*, i. 215.

but there are delicate shades of diagnosis that no language can convey, stored up, without verbal expression, in the eye, the ear, and the touch. Such knowledge, however sufficient for the individual, can be only to a very limited degree, and with difficulty, communicated to others. A *sense* impression, strictly speaking, cannot be directly communicated at all.'[1]

§ 1010. The person who has tact, good taste, delicacy of perception, natural good manners, could seldom draw up rules for others.

I might add something which J. P. Richter says, viz. that he had never climbed a steep and difficult staircase of argument without finding a woman at the top of it, who could by no means tell him how she had got there.

§ 1011. Certainly more wonderful things are done by unreflective instinct, or rapid insight, a kind of ἄλογος αἴσθησις, than by ranged and ordered reasoning. No one has ever satisfactorily explained the marvellous homing sagacity of the pigeon or dog, or the unerring sense of direction of the New Zealand bushman,[2] any more than the daring *salto mortale*, the imaginative leap, of a Kepler or Galileo admits of explanation, or (even to himself) the feats of the calculating boy. Cloten, again, who 'cannot take two from twenty and leave eighteen ', has a cunning whose operation it would be difficult to put into syllogisms. Many intelligences of a low order have a kind of slipshod intuition of

[1] *Logic*, Pt. I, p. 42.

[2] The *Times* correspondent, Mr. Stillman, described in that journal, some years back, his being lost in the forest of the Adirondacks. 'The agitation which supervened in an instant was little short of insanity.' But instead of racking his brain to recover signs and indications, he says, ' I sat down, covered my eyes, and had still sufficient command of my nerves *to wait for will to regain the power over reason*; and when I opened my eyes I had my compass again directly.' (See an article in the *Spectator* of Sept. 25, 1897, on the Sense of Direction.) Such a power is probably a kind of hyperaesthesia, an extreme sensibility to deviation from a determined line. Most people, after walking or driving through tortuous streets, know which are the cardinal points. It is recorded of Kaspar Hauser that he could not judge distances and saw everything flat. Yet he could distinguish the leaves of trees by their smell. He could not be persuaded that a ball did not roll because it wished to do so, or that his top did not spin of its own accord. He saw no reason why brutes should not behave exactly like human beings, and was seriously annoyed because the cat refused to sit up at table and eat with its paws. As he learned to think like ordinary people the extraordinary acuteness of his senses began to pass away.

relations and analogies. Lord Melbourne said of a certain measure of reform that all the clever men were for it, and all the fools against it; and the fools were right! Hartmann uses the phrase 'unconscious reason'. Hamilton, on the other hand, considers that, unlike digestion, respiration, or circulation of the blood, 'Reason is *ipso facto* conscious.'

§ 1012. I must repeat, however, that the difficulty is purely a psychological one, with which Logic has nothing to do. It may or may not be true that, as Leibnitz insists, man alone has the power of ratiocinating, and that even man seldom consciously arranges his ideas in regular syllogistic form. But what the logician says is that reasoning or inference can only be *rationally exhibited* in that form. A baby abstracts a quality. It dimly apprehends it as a cause of some effect—perhaps mistakenly; but anyhow the perception of causality is a major premiss, and all the elements of mediate reasoning are present. It fears the cat's claws and cries for sweetstuff, reasoning without words, and yet reasoning. But call such mental process, if you will, only association of ideas—though this explains nothing. Be it so that the human infant has not a more direct perception of cause than the bee or the elephant—and at what point the linked association of similars becomes something higher, something more than 'little bells of change' lightly stirred from one to another, need not be discussed. If men reasoned but as sensitive plants reason, or even as the veined marble, the dews and frosts, the changing moon or wheeling planet, the *omnia opera Domini*, are guided from moment to moment by the *immanent plan of their being*[1]—still whatever anything does, be it glacier or fly-catching plant, or pointer,[2] or nursery philosopher, or statesman, or

[1]
                    A tree
        That buds and blooms, nor seeks to know
        The law by which it prospers so.

[2] The Master of Downing (Dr. Alexander Hill) remarks that 'Dogs can think, for thought is the comparison of present with past sensations, but it is the prerogative of man's reason to argue not from things but from inferences' (*Lecture at the London Institution*, Nov. 16, 1903). In a brute's comparison, however, there is no synthesis under a notion. The action of the faculties is reflex only, not intellectual. The sensory impressions are automatically and involuntarily linked together; whereas thought contains an element of will and attention. The horse which you buy and which you find stops at every public-house has acquired an instinctive

angel, is done, consciously or unconsciously, in accordance with
the law of cause and effect, and if one thing *follow rationally*
from another, if this thing *lead rationally* to that, the consequence
must be in accordance with some law, that is, with some major
premiss.

§ 1013. Logic declines to ask how consciousness of, or power
to act in accordance with, the law is communicated by the
Creator to each of His creatures. That it *is* communicated is
merely to say that nothing happens by chance and without law.
The physiological conditions of mental action, again, do not
affect the *form of Reason*. If certain nerves connecting eye
with brain were destroyed, a hungry dog with food in front of
him would make no effort to obtain it, seeing but not associating
this with that. Human beings too may lose the power of sub-
suming presentations under ideas. But none of these considera-
tions enters into the province of the logician, who merely says
that *if* a conclusion is drawn it is not a *conclusion* unless it is the
result of a mediated process. We may conceivably *get* from
one fact to another like it, but we can only conclude it by a
syllogism.[1] The question is not, How do you think this? but,
Why do you think it? Induction seeks the one in the many.
Deduction applies the one to the many. We cannot reason
from the many to the many except through the one.[2]

habit, and we often remark how wonderfully dumb creatures remember.
But memory, in the sense of recollection, implies conceptual intelligence,
which brutes certainly do not possess.

[1] 'A conclusion is never a mere perception. It is the result of a process'
(Bradley, *Logic*, p. 226). 'An inference is nothing but a necessary truth'
(ibid. p. 221). But in Mill's view there is nothing which necessitates.
Hume's doctrine of Association 'dissolved knowledge into a chaos of
fleeting and unrelated sensations' (Bosanquet). It was with him a dis-
connected manifold. It is difficult, no doubt, to follow abstract reasoning
without concrete illustrations. 'Take a case', we say. But this is because
words often fail to convey any clear image to our minds. Only by taking
a case do we perceive the universal in the particular. Spencer, indeed,
will not allow that a quality is *the same* in two objects. It is only *like*.
There is no one in many. What, however, is *likeness* but the apprehension
of one and the same attribute in two or more things?

[2] Jevons quotes Sir Walter Raleigh on the dog. 'This creature (saith
Chrysippus) is not void of logick. For when, in following any beast, he
cometh to three several ways, he smelleth to the one and then to the
second; and if he find that the beast which he pursueth be not fled one
of these two ways, he presently, without smelling any further to it, taketh

§ 1014. It is a commonplace of philosophy that our perceptions only become judgements as inferences. The delicate adjustment of the eye notices the slightest deviation from the perpendicular of a vertical line. But the conscious judgement is mediate, not immediate. If I say, 'This is germander,' it is because I know that the flower of that name is of that shape and hue. A *prestissimo* on the pianoforte is performed by a succession of inferences. The mind seizes, and works with incredible rapidity, on the *data* which fly by it, and can give very little account of the process at the time or afterwards. In billiards the player thinks sub-mentally, 'This is (approximately) the sort of stroke which effects such or such a result,' though scarcely any collocations of the balls are exactly alike. There could be no illusions of the senses—'cheating the eye with blear illusion'—apart from inference. The expression would be meaningless unless it implied interpretation. On the other hand, there is more intuition, and less syllogizing, in 'Yonder soldier has fallen', than in 'Yonder soldier is shot'. Inference may occasionally go deliberately counter to the deliverances of sense; as if I see, or think I see, a pea placed under a thimble I at once infer that it is elsewhere, on the general principle that in the case of a thimble-rigger things are not what they seem.

§ 1015. Is there any major premiss in substitutional inference, the identification or equation of individuals or of aggregates? Such identification or equation must be looked upon as really a subsumption. We can make a present of the name 'major premiss' to those who carp at it. All that we have been contending is that S could not be judged to equal P (as a matter

the third way. Which, saith the same Philosopher, is as if he reasoned thus :—the Beast must be gone either this, or this, or the other way, but neither this nor this: *ergo* the third. So away he runneth.' Lord Avebury, on the other hand, considers that brutes are only first-class automata. We refuse to decide. For our purpose it skilleth not.

In Milton the 'winged hierarch' Raphael, in conference with Adam, says of the Soul :—

> Reason is her being,
> Discursive or Intuitive. Discourse
> Is oftest yours, the latter most is ours,
> Differing but in degree, of kind the same.
>
> (*P. L.* v. 487–90.)

But neither do the mental faculties of angel and archangel concern us as logicians.

not of measurement but of inference) without the mediation of *M*, which can only mediate if it is (at least once) taken universally.

§ 1016. No doubt numberless examples might be adduced of inferences in which no major premiss, or mediation, is at first visible. For example, being told that there are five balls in four boxes, I infer that one box at least contains at least two balls. Where is the middle term? In spite of the impatience of those who say that the conclusion is reached by means of 'the synthetic activity of thought'—which is merely an appeal from form to matter—a deeper analysis of what passes in the mind is necessary.[1] It is through the material knowledge that five is one more than four, and that balls and boxes are discrete substances (so that a ball could not be partly in one box and partly in another, that the inference is reached. Our syllogism, then, is something like this:—

When a number of objects are contained in separate receptacles, fewer in number than the objects, one at least of the receptacles must contain a plurality of the objects.

The case of five balls being contained in four boxes is a case of [the middle term].

Then it is a case of one at least of the receptacles containing a plurality of balls.

No doubt, both major and minor premiss admit of explanation by simpler and higher concepts. But the seeming cumbrousness of a process is no presumption against its being a true analysis. Thought is immensely active and employed on the most various materials. It flashes from point to point, seldom conscious of the road it has travelled. It is not strange, then, that to exhibit the rational form underlying a complex thought is often a little difficult. It is unworthy of philosophers to insist on short cuts to truth. The major premiss, says Sigwart, is the statement not

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[1] Here are a few reasonings which need analysing:—' To-day is June 17. I need not light the carriage lamps till after nine o'clock.'—' We just won the last rubber. You owe me sixpence.'—' Quod tacitum velis nemini dixeris. Why did you speak of your plans before Mr. Pry?'—' Make hay while the sun shines. I will take another.'—' It never rains but it pours. I had three offers of employment by to-day's post.' Or take the following argument:—' Christmas Day falls on a Tuesday this time. Then there will be five Sundays in December this year, and also next. No, I forgot that that is a leap year.'

of a numerical generality, but of the necessity of connecting the predicate with the subject. Only by proving necessity can the particular *data* be proof of any particular case.[1]

There remain reasonings of the type, ' $\frac{3}{4}$ of M are P, $\frac{2}{3}$ of M are S; therefore Some S's are P.' It is plain that the inference is only possible on the supposition that the relations of the fractions $\frac{3}{4}$ and $\frac{2}{3}$ to one another and to the whole of which they are parts are a *datum*. We require to premise that $\frac{3}{4}$ and $\frac{2}{3}$ are both greater than $\frac{1}{2}$, and further that two fractions of a whole which are both more than the half of it must necessarily overlap. Then, equationally, the portion of P which equals $\frac{3}{4}$ of M must overlap the portion of S which equals $\frac{2}{3}$ of M. The young student must beware of thinking that if most of $M = \frac{2}{7} P$, and most of $M = \frac{3}{5} S$, $\frac{2}{7} P = \frac{3}{5} S$; or that, if half of $M =$ all P and half of $M =$ all S, any S is necessarily P.

[1] *Logic,* i. 361.

CHAPTER XXX

IS SYLLOGISM A *PETITIO PRINCIPII*?

§ 1017. SOMETHING more must be said about the widely repeated charge against the syllogism of *petitio principii*. I have quoted the emphatic assertions of Mill, Bradley, and Bosanquet to that effect. Logicians, remarks the first-named writer, 'though unable to dispute it, have usually exhibited a strong disposition to explain it away; not because they could discover any flaw in the argument itself, but because the contrary opinion seemed to rest on arguments equally indisputable.' The objection is as old as Sextus Empiricus, who argued that the major premiss can only be established by induction, and induction supposes the examination of each individual case. Even authors not of the Empirical school have lent some countenance to this superficial criticism. Hamilton himself, though (following Petrus Hispanus) he observes that it is thoroughly disposed of by the analytical order of the syllogism—when we start from the conclusion, and search for evidence in support of it—has a passage in his Nineteenth Lecture [1] about universals which, Grote remarks, 'one might almost imagine to have been written by Mr. Mill.' His expression, 'We can only take out of a general notion what we had previously placed therein,' merely means that definition and deduction cannot lead us to new truths. But it resembles the travesty of the syllogistic process as 'the operation of placing objects in a class and then finding them there'.[2] The question is whether the conclusion is inserted in the major premiss by the minor premiss or (as Mill holds) by the previous induction. Mr. Grundy too remarks: 'It may be conceded that the major premiss virtually contains the conclusion.' [3]

§ 1018. The proposal to skip the major premiss involves, as

[1] *On Logic*, i. p. 380.   [2] See Mill *On Hamilton*, p. 504.
[3] *Aristotelianism*, by Smith and Grundy, p. 120.

I have pointed out, the abolition of the minor premiss; for in Mill's view of inference the rule or major premiss needs no explicit application. But why not at the same time abolish the conclusion also? If it is already asserted in the major premiss, and is involved in the instances out of which that is built, it is a waste of breath to assert it again. In fact the New Syllogism need have neither major, minor nor conclusion, all that is left being the preliminary inductive scaffolding. And this also, according to Sir William Hamilton, is a 'glaring *petitio principii*'.[1] It only survives, at most, as a reading-off of shorthand into longhand. But, as Devey asks, 'What help can mood and figure, with the heavy accompaniment of a group of rules and canons which exclusively relate to pure inference, lend to the interpretation of general propositions formed from the results of one's individual experience? . . . The only things which can be of any service in the interpretation of general propositions are a clear perception combined with a capacious memory; and Dugald Stewart was consequently more consistent when, entertaining the same principles as Mr. Mill, he rejected the syllogistic theory altogether, and resolved all reasoning into intuition and remembrance.'[2]

§ 1019. That every conclusion from premisses is taken out of the premisses, and is a combination of the two premisses, needs no saying. The act of combining is what we mean by syllogizing (συλλογίζεσθαι). To object to such a mode of proving the conclusion that it is a *petitio principii* would be ridiculous. On that showing all proof is a begging the question, since nothing can be proved except by allegations which together contain it, that is by evidence. An opponent may say, 'I deny both your premisses,' but he cannot say, 'You ought not to ask assent to them, since together they prove your point.' It is just in the *together* that proof lies (see above, § 997). On the other hand, an opponent may justly object to either premiss separately that it is merely the desired conclusion in another form of words. The charge of *petitio quaesiti*, then, can only be advanced against one proposition at a time. In any case it is not a formal, but only a material, fallacy.

§ 1020. Does, then, the major premiss contain the conclusion in such a sense that without the addition of any further material

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[1] *Lectures on Logic*, ii. 174.   [2] *Logic*, pp. 158, 159.

knowledge the latter is seen to be involved in it and can be at once affirmed? If I say, 'All Members of Parliament have certain privileges,' do I thereby assert that Mr. Wilkins has those privileges, or the Earl of ——? Surely every one must agree that we have first to determine whether Mr. Wilkins has a seat in Parliament, and whether the Earl of —— is a peer of the United Kingdom. The conclusion about either having privilege of Parliament cannot be formally drawn until the fact of his being a Member has been asserted in a minor premiss. The hackneyed illustration, 'All men are mortal, therefore Socrates is mortal,' is one to be avoided, because no assertion of Socrates being a man seems needed. (It may be said, perhaps, that from 'All Members of Parliament have privileges' we might go straight to the conclusion, 'Then Mr. Wilkins, M.P., has them.' But the parenthetic 'M.P.' here—i. e. 'because he is an M.P.'— *is* the minor premiss.) On the other hand, I have purposely taken an illustration expressed in extension so as to make no concession to the idea that it makes the slightest logical difference whether an abstract universal is expressed in extension or in intension—whether, that is, we say 'All Members of Parliament have', &c., or 'Membership of Parliament involves having'. The former, logically if not grammatically, is just as general a proposition as the latter. 'All men are mortal' is as abstract as 'The attribute of humanity is accompanied always by the attribute of mortality'. The importance attached by Hamilton and his followers to the distinction was not properly thought out. Imogen, in *Cymbeline,* says: 'Hardness ever of hardiness is mother'; which is as much as to say, 'Those bred in hardship come to be hardy.' 'Men of noble birth should have high ideals' is equivalent to 'Noblesse oblige'.

§ 1021. Mill observes :—'When you admitted the major premiss you asserted the conclusion. But, says Archbishop Whately, you asserted it by implication merely. This, however, can only mean that you asserted it unconsciously; that you did not know you were asserting it. But, if so, the difficulty revives in this shape—Ought you not to have known? Were you warranted in asserting the general proposition without having satisfied yourself of the truth of everything which it fairly includes? . . . It is hardly necessary to say that I am not contending for any such absurdity as that we *actually* "ought to have

known" and considered the case of every individual man, past, present, and future, before affirming that all men are mortal. . . . I do not say that a person who affirmed, before the Duke of Wellington was born, that all men are mortal, *knew* that the Duke of Wellington was mortal. But I do say he *asserted* it.'

§ 1022. It was not asserted implicitly. But 'it is impossible,' says Mill, 'to attach any serious scientific value to such a mere salvo.'[1] Then it must have been asserted explicitly. How paradoxical such a contention is, is seen directly we leave Socrates and the Iron Duke, and take other illustrations. 'Blessed are the peacemakers. John is blessed.' 'Wednesday is market-day. To-day is market-day.' 'Who drives fat oxen should himself be fat. James should be fat.' 'First come first served. Serve me first.' 'Isosceles triangles have the angle at the base equal. This triangle has the base angles equal.' 'A husband should be loved above a brother. Philip should be loved above William.' 'Honesty is the best policy. You are following the best policy.' 'Obsta principiis. I must make a stand now.' 'The slowest horses are to be left behind. Jenny is to be left behind.'

§ 1023. In what conceivable sense these conclusions can be regarded as having been explicitly asserted in the general propositions to which they are annexed I am unable to discover. Is it not obvious that a link is missing? How do we know formally that John is a peacemaker, that to-day is Wednesday, that James drives fat oxen, that this triangle is isosceles, that Philip is the husband and William the brother, and not the other way, or ascertain without being told any of the other minor premisses which are omitted above? 'Ought you not to have known? Were you warranted in asserting the general proposition without having satisfied yourself of the truth of everything which it fairly includes?' For example, I suppose we must not say 'Whoever gets most marks will win the prize' until we know for certain that Dobbin will win the prize. Dobbin, of course, as getting most marks. But to add that is to add the minor premiss, which is not wanted if the conclusion has been asserted in the major premiss.

§ 1024. It cannot be supposed that Mill regarded general

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[1] *Logic*, p. 211.

truths as obtained through a 'perfect induction' by simple enumeration without any contradictory instance, for no writer has done more to put the enumerative induction in its proper, and very humble, place. Nor can he merely mean that before making a general assertion we ought to satisfy ourselves that it is not liable to be upset by a contradictory instance, as yet unsuspected. As soon as we are satisfied of the connexion of cause and effect we proceed to a general statement, and thereafter apply it to any new case which fulfils the conditions. If there was an error in the induction the conclusion may be wrong. But that is very different from the doctrine that the conclusion was actually (*not* implicitly) asserted in the assertion of the general truth. Abstract is not concrete. We may be sure of a truth, yet hesitate long as to its application. It is right, as in John Byrom's lines, to wish a blessing on the King and also on the Pretender—but which is King and which Pretender?[1] Shakespeare's burghers of Angiers were similarly perplexed for a minor term.

§ 1025. The Gordian knot waits to be untied till the right person comes. 'Heus! mensas consumimus' fulfils an old and dark prediction. 'To-day is this Scripture fulfilled in your ears.' Of course futurity makes no difference. A truth is not more general for being about the future. Only in that case the notion that generalizations are summaries of empirical facts is the more paradoxical. 'Whatever thou askest I will give it thee.' If 'the class is nothing but the objects contained in it', as Mill says, there would be no room for deductive science, and Leverrier would never have conjectured the existence of Neptune. If the syllogism is a *petitio principii*, what room is there for Faith, which is a combination of reliance and venture, clinging through good report and ill report to its deductions? Before I say, 'omne ignotum pro magnifico', must I first know everything that is *ignotum*? Or does 'quodcunque evenerit optimum' imply that I already know everything that has happened or will happen? Mill's 'You ought to have known' is certainly very incomprehensible.

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[1]   God bless the King, God bless the Faith's defender;
       God bless—no harm in blessing—the Pretender.
       But which Pretender is and which the King,
       God bless us all, that's quite another thing.

§ 1026. Sigwart well says :—

' That any idea may be general, i. e. applicable to any number of particular ideas, is involved in its nature as reproducible, and no way depends upon its having been formed from a number of such particular ideas. As soon as it has disengaged itself from the original intuition with its spatial and temporal connexions, and is a mental image which can be freely reproduced, it is capable also of fusing with a number of fresh intuitions or ideas, and of appearing as their Predicate in a judgement.' [1]

§ 1027. If any Syllogisms, then, involve a *petitio* they cannot be those which have a general statement for major premiss, truths which would be true if every individual example were annihilated, but only those whose universal major is an *inductio completa per enumerationem simplicem.* Such a 'perfect induction' is not a logical inference but a mere summary, or aggregate, of observations. Every case has been examined. 'Cantico nunquam utuntur scriptores Novi Testamenti,' says Ewald. King Richard II exclaims—

> Christ in twelve found truth in all but one ;
> I in twelve thousand none.

' Brother, brother, we are both in the wrong.' ' All, all are gone, the old familiar faces.' ' There is not a single misprint in this book.' ' Ilka lassie has her laddie.' ' There are no men to conquer in this wood.' ' Every one of my pieces (at chess) has been taken, except the bishops.' ' Never was there Claudius yet but wished the commons ill '—though for each of these concrete statements a cause might be suggested. Sir Robert Walpole did not say, ' Every man has his price,' but, ' All these men (his critics) have their price.' The former judgement was regarded by Ruskin as the Free-trade formula.

§ 1028. The charge, however, of *petitio principii* cannot be brought home even to those syllogisms whose major premiss has been reached by examining each several case. For who has examined the several cases ? Not necessarily the reasoner. To him the major premiss may be a *datum* supplied from outside his own experience. It is given out, ' All who entered their names have passed.' I entered mine. Then I have passed. This is in my mind a genuine process of illation. I see it stated in the newspaper that all the members of the Cabinet are

[1] *Logic,* i. 46.

University men. Is Lord —— in the Cabinet? (I refer to Dod) Yes. Then he was at one of the Universities. All the men in this room are widowers. Indeed ! I did not know that Mrs. N. was dead. All the present sovereigns of Europe are men of character. *Quaere*, Is Montenegro in Europe or Central Africa, and has it a sovereign ?

§ 1029. Even when the major premiss has been supplied by the reasoner himself, and he is summarizing facts for no other mind than his own, still it is unlikely that the conclusion has been explicitly stated in the major premiss. To decipher one's own notes or interpret one's own memoranda is actually to infer. If I say, 'Every day since we came home there has been a visitor,' I cannot at once assert that there was a visitor on September 20 without consulting my diary. Did we come home on the 18th or the 21st? 'They are all dancing so well. Oh, there is Mr. ——, I did not recognize him at first.' ' I liked all the masters I was under at school. I forget the name of the German master.' A summary is not a mere compendious enumeration. 'All my brothers are married' is not merely ' Brother Ned, brother Dick, and brother Henry are married ', but there is the further implication that I have now no unmarried brother. The major premiss might have been so expressed. This is the point of the statement ; and suppose I had so many brothers (or cousins) that I could not in a moment remember their names, even though I had passed through all the list before making the statement, the recollecting of any name would constitute a true logical subsumption. The minor term indeed might actually be mentioned in the major premiss, if it were with a great number of others, and yet the speaker or writer find it necessary to go back to make sure that it was mentioned. The directing special attention to one item or name in a long list is a kind of subsumption. In fact *petitio principii* is only fallacious *relatively* to considerations outside the purview of the logician, as such. It is nothing to him by what steps a premiss has been reached. It should be observed that a statement such as this, 'All my brothers, viz. Ned, Dick and Henry, are married,' is really a complex of a major premiss and three minors, enabling three conclusions to be drawn. ' All my brothers are married. Ned is one of my brothers. Therefore &c.'

§ 1030. There might be a *petitio principii* in what looks like the *minor* premiss, as follows:—'Few of the crew can swim. William is one of the few.' But in this illustration there is really no minor premiss, for 'one of the few' means 'one of the few who can swim',[1] like 'Six have won prizes. You are one of the six'. On the other hand, 'Our six best scholars have won prizes. You are one of the six,' is a true subsumption, if it means, not, You are one of the six who have won a prize, but You are one of our six best scholars.

§ 1031. If the comprehension of judgements be regarded instead of their extension, it would be easy to transfer from the major to the minor premiss the charge of begging the *quaesitum*. It might be pleaded that we cannot predicate the middle term of the minor unless we know all the characteristics of the latter,[2] one of which will be the major term. 'Bad poets are insufferable. Bavius is a bad poet'—but can I, Mill might ask, say this without first judging him to be insufferable? Which is as much as to ask, Can I say that a man has stolen my horse without first judging that he is liable to get five years penal servitude?

§ 1032. More plausible than any of the objections to the Syllogism hitherto advanced might be a criticism that the middle term is in ordinary speech, more often than not, mixed up grammatically with other elements of the proposition, and yet requires no change of syntax in order that inference shall take place easily and naturally. Thus, 'Little things please little minds. His mind is a little mind. It follows that little things please his mind.' 'A providence watches over fools. He is a fool. Then a providence watches over him.' '*Corruptio optimi pessima*. This is *optimum*. Then its corruption is *pessima*.' '*Vae victis*. Greece is vanquished. Woe, then,

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[1] So—

> Shadows of three dead men
> Walk'd in the walks with me,
> Shadows of three dead men, and thou wast one of the three.
Either one of the dead, or one who walked with me.

[2] See Lötze, *Logik*, 2nd ed., p. 122, and Sigwart, *Logic*, i. 357–9. We must not confuse the various properties which any nameable thing in fact possesses with the analytical content of the name or concept; and it may be said that we cannot but know the latter, for the concept is *our* concept, whereas the former we may or may not know. But a major premiss is required for realization, as for information. See above, § 529.

to Greece.' '*In dubiis libertas.* This matter is undecided. Then there should be liberty in regard to it.' '*On est puni par où l'on a péché.* Her fault was such and such. That, then, was the means of her punishment.'

§ 1033. This is especially the case with propositions which have 'All things' or 'Nothing' for subject, or which are impersonal, or in form imperative. As—' conanti nihil difficile.' 'All things come to him that waits.' 'To him that hath shall be given.' 'A tout malade il faut un médicin.' 'De gustibus non est disputandum.' 'Detur digniori.' 'Experto crede.' Though the subsumption may after all attach itself to the weak grammatical subject; e. g. 'To the pure all things are pure. *This* thing, then, is pure to a pure person.' 'To him who tries no task (*nihil*) is difficult. This is a task. Then to him who tries it will not be difficult.' The minor premiss of 'obsta principiis' may be either, 'Here is a beginning. What shall I do to it?' Or, 'I am ready to make a stand. But where?' When the grammatical subject is a singular term, it is not usually the true middle. 'God loveth a cheerful giver.' 'Fortes fortuna juvat.' The Americans have a saying, 'You cannot stop half-way down a cataract.' 'England does not love coalitions.' And yet the reasoning might be—' The country we are speaking of is (remember) England. In such a country, then, a coalition is sure to fail.' Or, with ' cultores Sui Deus protegit ' as major premiss, the minor might be, not ' This is a worshipper of God ', but ' He whom we are speaking of is God '. Sometimes the middle term might be equally well found in the grammatical subject or object, as, 'finitimus oratori poeta ' (*Cicero*); 'omnia omnium sunt' (Spinoza); 'proclivi lectioni praestat ardua.' ' Suum cuique ' might have for minor and conclusion either, '*X* is a person. Then let him have his own.' Or ' This is mine. Then meum mihi '. So 'trahit sua quemque voluptas '. Under—

> Every object swells with state ;
> All is pious, all is great,

in Handel's *Solomon*, we must subsume ' So and So is an object '. But to ' No man is a hero to his valet-de-chambre ' it would be unnatural to join, 'A tramp is a man ; therefore a tramp is not a hero to his valet-de-chambre,' though the reasoning is unimpeachable. We want, ' Here are a man (*subaudi* famous) and his body-servant. The one is not a hero, then, to the other.'

§ 1034. It may seem, then, that, instead of *Barbara Celarent*, we could frame valid syllogisms by merely substituting the minor term for the middle in the major premiss.

> Fata regunt homines ;
> Brutus est homo,
> *Ergo*, fata regunt Brutum.

Of that which is good, even in evil things, God is the author (Hooker).

War is an evil thing.

Then, Of that which is good in War God is the author.

§ 1035. But what is the justification of such inference ? Is there any *rule* which we *apply* ? A rule asserts that a subject possesses such and such attributes, is followed by such and such an effect, exists in such and such a state, or the like. Now the thing predicated of *men* that they are *ruled by destiny* may equally well be expressed grammatically by 'fata regunt homines' as by 'homines a fatis reguntur'. Logically, whether the case be accusative or nominative, a certain subject is said to be affected, or determined, in a particular way. And the same with the other examples. We must get behind the grammar to the logic.

Of course reasonings like the one just given are not really in the Second Figure. Figure II would require, 'fata regunt homines. Caesar regit homines'—from which nothing would follow strictly.

§ 1036. In such a phrase as 'votis venerabere seris' the true logical subject is not 'tu' but 'vota', 'seris' being a tertiary predicate. Compare 'inutile ferrum cingitur'. On the other hand, every grammatical categorical sentence, having subject and predicate, constitutes a logical judgement. Thus, 'non haec in foedera veni' means, 'foedera in quae veni non erant haec.' But, taking the sentence as it stands, 'ego' may be regarded as logical as well as grammatical subject (understood), and 'having come into this agreement' as the logical predicate.

§ 1037. Having vindicated the necessity of major premisses, or universals, we go on to consider how they are obtained.

The Inductive problem may be stated in various ways (S = subject, P = predicate, M = middle term), as follows :—

1. I (*S*) have drunk tainted milk (*M*). What will be the result? *Find a P which can be proved of M* (ma. pr.). *Then deduce.*

2. I (*S*) have drunk tainted milk (*M*). Will typhoid (*P*) result? *Prove P of M* (ma. pr.). *Then deduce.*

3. I (*S*) have typhoid (*P*). What is the cause (*M*)? *Find M, and prove both premisses* (*P of M and M of S*).

4. I (*S*) have typhoid (*P*). Is drinking tainted milk (*M*) the cause? *Prove both premisses* (*P of M and M of S*).

5. I (*S*) have typhoid (*P*). Is the tainted milk I drank (*M*) the cause? *Prove major premiss* (*P of M*).

6. I (*S*) have typhoid (*P*). Drinking tainted milk (*M*) gives it. Have I drunk any? *Prove minor premiss* (*M of S*).

7. *X, Y and Z* (*S, S', S''*) have typhoid (*P*). What is the cause (*M*)? *Find M and prove it of X, Y and Z* (a succession of minors).

Deduction.—As many minor terms (*S, S', S'', S''',* &c.) as can be assumed under *M*, so many conclusions (*S* is *P*, *S'* is *P*, &c.) are there. If the major premiss *M* is *P* is a general and abstract principle, the number is ideally unlimited.

Induction.—Conversely, the major premiss, *M* is *P*, is constituted of those same propositions, *S* is *P*, *S'* is *P*, *S''* is *P*, &c., these together making up *M*.

But to rise above *enumeratio simplex* and prove a law or causal connexion between *M* and *P*, it is not enough to show that *S, S', S'',* &c., being *P*, are each of them *M*, and together make up *M*. We want, ' *MS* is *P* ; No *MS* is not *P*. Then *M* is *P*.'

CHAPTER XXXI

UNIVERSALS, HOW OBTAINED?

§ 1038. THE Concrete Universal proposition—such as 'All the lights are lit'; 'None of the passengers was killed'; 'Every question on the paper is beyond my powers'—was by the original propounder arrived at by simple counting. How is the Abstract Universal proposition reached—that which formulates a law or general principle? This alone merits the name Universal, for universality and complete enumeration are opposites. 'Every seat is occupied' is just like 'Glasgow is a large city', or 'Cain killed Abel'. A general proposition, on the other hand, is extensionally incomplete, unlimited. It implies a pervading rule, applicable to an indefinite number of cases, realized and unrealized. Wherever the cause appears the effect will appear also. An abstract judgement generalizes; it does not confine itself to the facts it has observed. It is therefore—assuming no counteracting cause—both predictive and retrodictive—e.g. an astronomical table will foretell eclipses for ages to come and also tell the very moment at which eclipses have occurred in long ages past. Yet a judgement ideally infinite in its application may be, and often is, based upon a single experience. Ab uno disce omnes. The universal is recognized in the particular. And knowledge is only possible through universals. We are for ever seeking some general law under which to subsume the individual fact.

§ 1039. By what process, then, is the statement of any general principle or law attained? Is it a formal or a material process? Given an extension from the known to the unknown, the business of Logic is to justify it formally. What we have to ask is whether the formal justification of this step, which is called Induction, is different from the formal justification of any deductive conclusion. Are Induction and Deduction two kinds of reasoning; or is it not rather out of the question that rational law should be otherwise than one?

§ 1040. The One in the Many sought by this or that Induction is not a formal but a material law, just as the conclusion of a syllogism states, qua proposition, a material truth. Nevertheless the connexion between the judgement arrived at and the ground on which we arrive at it is necessarily rational and formal. And Logic is exclusively concerned with what is formal. Were it to concern itself with 'the objects about which thought is conversant', its task would be boundless ; for why should it embrace some knowledge and not all? It would be not the science underlying all sciences, but the universal science, the science of the universe. Logic must deal with all matter or with none.

§ 1041. As Mansel remarks, Logic cannot exhibit a law of external nature. 'Material knowledge arises from the observation of differences : the essential feature of laws of thought must be the abstraction from all differences.'[1] Mill does not, of course, maintain that the logician, as such, investigates the properties of things. But when he affirms that Logic is the art of all Thinking, and that the end of Thinking is the attainment of Truth, he falls into a dangerous ambiguity. Logic, he asserts, is not simply Formal Logic. It has a higher and wider aim than to warn us off from inconsistency. 'The laws or precepts provided for the guidance of thought must surely have for their principal purpose that the products of thinking shall be *true*.' Does this mean that Logic is to guarantee the materials on which Reason works ? Does it 'guide thought' in the sense of instructing the intelligence what to observe and how skilfully and accurately to compare ? Is Logic, after all, the Science of Observation and Experience, or of the conditions of Truth? But the conditions of Truth, as distinct from Consistency, are determined by Metaphysics, not by Logic. It is, says Mill, the 'Philosophy of Evidence and of the Investigation of Nature'. Yet he claims that the rules of the Higher Logic, as of the 'narrow' Logic of Consistency, 'are applicable to thought generally, abstractedly from particular matter.' But then again we are told—'In no case can thinking be valid unless the concepts, judgements and conclusions resulting from it are conformable to fact'. Therefore we must not merely examine the relations of one part of the train of thought to another, but we must 'ascend to the original sources, the presentations of

[1] *Proleg. Logica*, p. 176.

experience, and examine the train of thought in its relation to these '.[1]

§ 1042. The word *valid* in this passage has taken the place of *true*. Validity is conditional truth. Granted the *data*, the conclusion if correctly drawn is true. But the investigator of Nature aims not at conditional but at actual truth. He must therefore examine the phenomena. He must interrogate Nature. Only in this way can the bounds of human knowledge be extended and amplified. But then how can Nature be interrogated 'abstractedly from particular matter'? Rules may be laid down for the investigation of a particular class of phenomena, or for the investigation of phenomena generally; and all rules are abstract relatively to the actions which they prescribe, all method relatively to the knowledge methodized. But it is impossible to draw up rules and principles of observation which shall be purely immaterial. Experimental studies cannot be directed by any science which claims to be wholly formal and abstract. The question is this:—Ought a science which concerns itself, however generally, with the contingent Laws of Things to be called by the name of Logic, so long at any rate as that name is given to the science of the principles of valid inference, abstractedly from the materials on which inference is exercised? It must surely appear unphilosophical to combine, as empirical writers do, between the covers of one book two such diverse kinds of inquiry.

§ 1043. And yet the Inductive process undoubtedly implies *inference*. And at first sight the process of inference by which we obtain our major premisses, and that by which we apply major premisses to a variety of cases, must seem to be quite distinct and, in fact, reverse processes. By the one we ascend from the particular to the general; by the other we descend from the general to the particular. Moreover, by Induction we widen our knowledge and obtain new truth. Deduction, on the other hand, merely makes explicit what before was known implicitly. It can never enlarge experience but only classify and synthesize it. We argue deductively to results, inductively to causes.

§ 1044. For all that, there must be some single element in all reasoning upon which its validity depends. Induction, says Mill tersely, is *proof*.[2] Now, the mental process expressed in

[1] *On Hamilton*, p. 471.　　　　[2] *Logic*, i. 352.

Therefore must be one and the same in all kinds of reasoning. A 'general theory of Evidence' cannot in the last resort be derived from the matter reasoned, the things proved, but only from the constitution of rational thought.   What is the principle which permits and compels the mind to conclude one thing from a combination of others ?   What is the ultimate formal justification of any and every argument ?   In deductive argument it is that everything persists in its own nature, that a law or principle holds good when applied. M being asserted to be P, then any case of M, e.g. S, is P; and if anything is not P it is not M.   Inductive argument has the same justification.   There are not two kinds of illative cogency.   The legitimacy of proof has but one title.   Professor Case, however, complains[1] that ' Such is the passion for one type that from Aristotle's time till now constant attempts have been made to reduce induction to syllogism. . . . Bacon alone was right in altogether opposing them.'

§ 1045. Inductive reasoning is, however, when rigorously analysed, just as syllogistic as Euclid, though not in the way indicated by the old logicians.   It is the application of logical law to a particular sphere—that of cause and effect.   It tries and rejects hypothesis after hypothesis as inconsistent with the axiom from which it starts, proving or discovering a law, a causal connexion, by successive reductions *ad impossibile*.   It is essentially applicative.   But being by its nature *pro-syllogistic*, that is, undertaking to prove our major premisses for us instead of assuming them as granted, it employs as its own major premiss, ultimate and undemonstrable, the Principle of Causality.   Or rather, this principle combined with the complement of it, the Principle of Sufficient Reason.   Every cause necessarily has *its* effects.   And every effect necessarily has *a* cause.   A child bursts open its drums and breaks its trumpets to see where the sound comes from, before it has learnt to formulate any general law of acoustics.   It is a law that there is a law for everything.

§ 1046. All reasoning presupposes some general proposition as *given*.   Inductive reasoning is the application of one of the most general of all principles, which is assumed as an absolute *datum* in every investigation, to minor premisses which in the final resort rest upon immediate experience, ἐμπειρία, that is on

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[1] *Encycl. Brit.*, 10th ed., art. ' Logic.'

the direct deliverances of the individual consciousness. ἐπαχθῆναι μὴ ἔχοντας αἴσθησιν ἀδύνατον. Taking the facts we subsume them under the law respecting laws, and so obtain the law of the facts.

§ 1047. The Canons of Induction as formulated by Mill, improving upon Bacon's Tables, are only variations of this highest Premiss as applied to the collated facts of observation or of experiment. The following is Mill's 'Method of Difference' :—

If an instance in which the phenomenon under investigation occurs, and an instance in which it does not occur, have every circumstance in common save one, that one occurring only in the former ; the circumstance in which alone the two instances differ is the effect, or the cause, or an indispensable part of the cause, of the phenomenon.

Let *a*, *b*, *c*, be the combined antecedents of the phenomenon *XYZ* ; *b*, *c*, of the phenomenon *YZ*. What is the cause of *X*? By the principle of Sufficient Reason it must have a cause, and that cause must be found somewhere among its antecedents— using this word in a philosophic sense—*a*, *b* or *c*.

Now if the cause were *b* or *c*, or both combined, *X* would always be found where *b* or *c* is found, or *b* and *c* together. The Law of Causality is here applied to a particular case. But, as we saw, *X* is not so found. Therefore neither *b* nor *c* is the cause of *X*. It follows that *a* is the cause. This is Bacon's method based on Exclusions and on the breaking up of the *data natura*. It is, of course, the method of the Patagonian child, who ascertains that it is the sun which makes him feel hot by first standing in the sunshine and then in the shadow, and of the infant who ascertains that hunger is relieved by nutriment, through comparing his sensations when he has food and when he has it not. Logically, the method is unexceptionable. What liability to error attends it arises from the practical difficulty of being sure that the instances of the phenomenon under investigation have every circumstance in common save one. Also the cause might be not *a* separately, but *a* combined with *b* or *c*. The dose which kills a man (combining with his constitution) may cure a rhinoceros.

§ 1048. When a combination of conditions produces a certain effect—e. g. the cavalier and his armour together tire the horse by their weight—it is often possible to isolate and subtract from the joint common effect that which each of the antecedents con-

tributes to it. We can weigh the armour, and see how much the beast will have to carry without it. The weariness of the horse could be apportioned partly to the rider and partly to his equipment. It is true we could hardly divide a stumble or fall in this way, and the camel's back remains unbroken till the last straw is placed on it.

Mill calls this way of arriving at a cause· the Method of Residues.

§ 1049. The Method of Concomitant Variations is closely akin to the Method of Difference and the Method of Residues, and yields a perfectly logical inference as to the cause of a phenomenon, always supposing that our observations are correct. If I am more sea-sick when the sea is rough than when it is smooth, I ascribe the sensation of nausea to the motion of the vessel. The increase of the sensation must be due to some added or augmented cause, and, *ex hypothesi*, the circumstances are the same except as regards the greater roughness of the sea. But I must be sure that the circumstances are the same. Something might depend on my health, or on my diet.

If a man were to say, ' Directly I married a few grey hairs appeared on my head. After some years of marriage they had much increased, and I find the longer I am married the greyer I get,' the suggestion of a causal connexion would be scarcely scientific. Or rather the lapse of time is here connected causally with the progressive effect, but not necessarily the continuance in a certain state of life. That might be as accidental as living in a certain house would probably be.

Occasionally the reason for a concomitant variation is obscure. Thus intellectual activity is said to vary with the discovery of gold.

§ 1050. Mill's other two Methods yield a probable conclusion only. The Method or Canon of Agreement says that the sole invariable antecedent of a phenomenon is probably its cause. If *a, b, c* be followed by *X*, and *a, d, e* also be followed by *X*, *a*, being the only common circumstance, is *very likely*, or at any rate *possibly*, the cause of *X*. But Plurality of Causes forbids us to say more. *X* might be due to *b* or *c* in the one case, and to *d* or *e* in the other. Because all *S*'s are *P* it does not follow that all *P*'s are *S*. We can only go on multiplying instances, thus excluding one hypothesis after another; and if *a* is found

to be always, in whatever circumstances we verify the suggestion, followed by X, we attain to a high probability that it is the cause of X. If a family which moves about a good deal gets into quarrels wherever it goes, we ascribe to it the fault rather than to the neighbours. And yet here, too, we must remember that it takes two to make a quarrel.

§ 1051. The Method of Agreement is reinforced by the Joint Method of Agreement and Difference.[1] This should rather be called the *Double Method of Positive and Negative Agreement.* Agreement in the non-possession of a quality is not difference. If wherever the above family resides there is quarrelling, and where it does not reside there is no quarrelling, we are more than ever convinced that it has itself to blame for the want of harmony. Still it may be otherwise. The peace of the places which know not this family may be due to other causes. If in several parishes where it takes up its residence, and in those parishes only in the whole county, there is an outbreak of scarlet fever or of a murrain, this is not enough to prove a connexion of cause and effect.

§ 1052. So far, however, as these two Methods enable inference to take place, that inference, as in the Methods of Difference, Residues and Concomitant Variations, is strictly syllogistic. A law of the highest generality is applied to observed facts, as major premiss to minor terms. That law, however, is not merely itself, like all laws, causal, but is a *law about causality.* When applied, then, to the observed facts it gives a conclusion which necessarily takes the form of a causal affirmation. In

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[1] Mill, who also calls the Method the Indirect Method of Difference, words his Third Canon thus :—' *If two or more instances in which the phenomenon occurs have only one circumstance in common, while two or more instances in which it does not occur have nothing in common save the absence of that circumstance; the circumstance in which alone the two sets of instances differ is the effect, or cause, or an indispensable part of the cause, of the phenomenon.*' The first clause is the Canon of Agreement. The second clause is the same negatively. If it were the Canon of Difference it would run, ' *have everything in common save the one circumstance.*' The last part might be worded—' *The circumstance spoken of is the effect, or the cause,* &c.' The word ' *differ* ' is unnecessary. Mill's statement errs in two points : (1) The negative instances cannot ' have nothing in common save the absence of that circumstance ', but must have in common the absence of innumerable circumstances. And (2), the two sets of instances do not differ in one circumstance alone.

any ordinary syllogism, on the other hand, the conclusion deduced may be a statement about a particular fact. We see, then, why Induction leads us to general principles, while Deduction conducts us to what is relatively concrete and particular. The conclusion of every syllogism is more concrete than its major premiss. But so are the generalizations obtained by the Inductive methods concrete relatively to the Law of Causality, which is in the highest degree abstract and general. Inductive treatises are really elaborate directions for marshalling the facts of observation and experiment so that each may be subsumed as minor premiss under this great *praemissa maxima*.

§ 1053. Since M is P and S is M, S is P. But analysing this deductive conclusion I ask, What is the explanation, or cause, of S being P? The answer is that S is M (minor premiss) and that M is P (major premiss). The minor premiss is given as a fact of observation. But how do we know that we must find in M the cause of anything being P? This is a law or generalization. How is it arrived at? We have to prove this of M. M therefore, hitherto suggested as a middle term, must become the minor term of a prosyllogism. Cases of M must be gathered together and examined, in order that we may frame the minor premiss of our prosyllogism. We then take for major premiss the ultimate Law of Causality, in the form (if possible) of the Canon of Difference :—

' If an instance in which a phenomenon occurs, and an instance in which it does not occur, have every circumstance in common save one, that one occurring only in the former, this circumstance is the cause of the phenomenon.'

But in the case of the phenomenon P, M is such a circumstance.

Then M is the cause of anything being P.

§ 1054. Thus regarded there is no more an *ascent* from facts to law in an Inductive argument than there is in any other syllogism. Every syllogism may conclude in a generalization, which however must be narrower than the major premiss. Thus from the law of gravitation we can deduce the general principle that the Earth attracts towards itself all ponderable objects whatsoever.

§ 1055. Every argument is composed of two elements, one given from above, the other won by a nearer experience-

Meeting they produce a conclusion, in which the law or principle given is applied to the experience won. If we set to work to prove the law true, we must still appeal to a higher law, which is in the end undemonstrable. There must always be a major premiss given.

§ 1056. From the point of view of Logic, then, Induction is merely prosyllogizing,[1] with the Law of Causality for major premiss. The rules for observing and experimenting, that is for arranging and ordering the facts out of which the minor premiss of the prosyllogism is to be constructed, are extra-logical. They belong to the matter, not the form, of reasoning, and constitute a separate subject, which has been admirably expounded by many modern logicians, but should be called Method rather than Logic.

§ 1057. I shoot an arrow into the air. It falls to earth, and I wonder why. What is the reason, the *ratio essendi*? What law should it be brought under? I consider its properties one by one. Regarded syllogistically, I am starting from the conclusion 'S is P' (my arrow falls to the ground), and to find the required M, or middle term, am trying one after another a number of possible minor premisses, having S (my arrow) for their subject—S is A; S is B; S is C; and so forth. The arrow is made of wood; it is feathered; it is barbed; it is a yard long; it is painted green; it is solid; it was shot in a certain direction; it was intended for the heart of a foe; and so forth.

The right selection is best arrived at by taking other possible subjects to P, other objects which fall to the ground—an apple, a thunderbolt, a dog, rain—and considering in what respect these all resemble S, my arrow. And if some of them resemble it in more points than one there must be comparison with further instances, until one common property only is left, viz. in this case body. This is the Method of Agreement. Conceivably a comparison with one other case of the phenomenon may suffice to establish an induction good enough to act upon, viz. where the resemblance is in one point only.

[1] The mediaeval school logician was always prosyllogizing, since in the game of disputation he was called upon usually to prove his premisses. The ground of his major he sought in some more axiomatic truth, finally getting back, if he could, to a text of Scripture or of Aristotle, or to some definition of the Church.

§ 1058. Or we might have proceeded by taking the properties of *S* one by one, and observing whether in other cases that property is followed by the effect, *P*. A bird, like the arrow, is feathered, but does not for that reason fall to earth. A leaf is green and does. A stone is discharged and does. Then we proceed by elimination and exclusion.

§ 1059. I have purposely taken an illustration—in some respects a poor one—in which the Method of Agreement holds good, for the reason that possible plurality of causes need hardly here be considered. Except a missile hurled by muscular or mechanical force in the direction of the earth, everything falls to the ground through one and the same cause, viz. the earth's attraction. And even the missile falls by the earth's attraction co-operating with the force exerted.

§ 1060. The Method of Difference would not be very easy to apply to this illustration, unless we could conceive an elfin arrow, unearthly and unsubstantial, which should not obey the law of gravitation. (By noticing however that the more solid bodies are the more violently they fall—a lead ball than a pith ball—we may reach our generalization by the Law of Concomitant Variations.) Which is the *M* which explains *S* being *P*? We observe something which resembles *S* in every particular but one (which it lacks), and is not *P*. Then that particular is *M*.

§ 1061. Logic however, I repeat, contributes nothing to these inductive processes except the syllogistic framework (which, starting from the conclusion, *S* is *P*, the investigator is endeavouring to fill in), and the Law that causes are always followed by their effects. The rest is observation and intelligence.

Fuller, in impeaching the conduct of John Capon or Salcote, Bishop of Salisbury in Henry VIII's time, and also that of Vesey or Harman, Bishop of Exeter, remarks :—' It seems as if it were given to binominous bishops to be impairers of the churches.' If the induction were intended seriously and not satirically, it would be a ludicrously unintelligent and careless one. The two prelates must have had some other point of resemblance besides the accident of a double name. But suppose both had been guilty of simony, and the phrase had run— ' It seems as if it were given to simoniacal bishops to be impairers of the churches '—the induction indeed would not be one whit improved logically ; for there must still remain many

other points of resemblance; but it would be much more probably correct. Usually it was the married bishops who were accused of rapacious depredations and nepotism. Again there is a droll connexion established in Macaulay's *Election Ballad* between Roman Catholic Emancipation and the price of firewood—

> A wood merchant told me to-day
> 'Tis a wonder how faggots have risen!

A child falls into the fallacy of *post hoc ergo propter hoc* when it supposes that a watch flies open because the owner blows upon it. In seeking for a constant element in the phenomenon it does not disengage it from casual and varying connexions.

§ 1062. With Bacon, followed by Reid and others, Inductive Method is the research for 'Form', the essence of a thing, Aristotle's τὸ τί ἦν εἶναι. We must analyse concrete phenomena, in which a number of 'forms' are coupled together—*formae copulatae*—into simple qualities. Finding the form of the 'simple nature', we are able to reconstruct the phenomenon. Upon the essential qualities depend the derivative qualities. Thus, a triangle, or trilateral, is essentially three-sided. Hence flows the property of its three angles being together equal to two right angles. The form or cause of heat, according to Bacon, is motion.[1]

§ 1063. The logician on the other hand cannot distinguish between causes. He interrogates not merely 'nature', with its clear demarcation of kinds, but the infinite range of possible predication. If I say, 'Faulty spelling is more venial than faulty punctuation', and you ask why, and I reply that the latter is a mark of slovenly thought, while the former only shows ignorance (arising nowadays, it is true, from want of observation), and may (as in the picturesque Elizabethan and Jacobean spelling) be a sign of character, I am assigning general characteristics, which may perhaps be called the form of the phenomenon.

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[1] There is a useful summary of Bacon's doctrine in Veitch's *Logic*, pp. 469–83. Mill observes that 'a more efficacious mode of interrogating nature has since Bacon's time shown that throughout one of the most extensive departments of natural philosophy there does not exist that sort of connexion between different truths which would enable us to deduce one of them from another as the schoolmen attempted to do' (on Whately's *Elements*).

But if we want to know why the cat breaks the china, and discover by observation or experiment that she is trying to get at the sardines in the cupboard, the generalization hardly rises to the dignity of essential form.   Even natural phenomena are conditioned by a variety of antecedents, among which the mere logician cannot discriminate, and which he cannot range or graduate.   The μέσον ζήτησις depends on the object in view. What makes this apple to have tumbled ?   If I am philosophizing I shall bring the phenomenon under the law of gravitation.   If I am in a practical mood I say that the fruit was clearly ripe, or that there was a high wind in the night.   As Mill remarks, if a man falls from a ladder we say nothing about the earth's attraction, but only that his foot slipped.   So the Village Wife and her uncomforting visitor explain the death of her daughter by primary and secondary causes respectively—'I thowt 'twur the will o' the Lord ; but Miss Annie she said it wur draäins '.

CHAPTER XXXII

PRINCIPLE OF CAUSALITY

§ 1064. THE tendency to subordinate the principles of Logic
to Natural Philosophy, and to make it conversant with the laws
of Things rather than those imposed by Reason upon Thought,
is evidenced by the ambiguous expression 'Uniformity of Nature'
for the supreme Axiom of Induction. Why *nature*?[1] The
word may, it is true, be taken to mean not merely the material
universe, but the entire circle of existences, actual and ideal.
'Forewarned is forearmed'; 'Comparisons are odious';
'Small is the worth of beauty from the light retired'; 'The
Red Lion is a good inn'; 'dulce est desipere in loco'—these
and a myriad other everyday statements may possibly be com-
prised under the uniform properties of 'Nature', but are hardly
intended by the phrase.

§ 1065. The Inductive Method applies to everything that can
be predicated. But the illustrations of writers on the subject of
Induction are almost invariably taken from the domain of
physical science, and make us familiar with Leyden jars, the
planetary orbits, oxygen, and the properties of common salt.
The vast and ever-widening sweep of philosophic Induction they
base, then, on the 'uniformity', the stability, the permanence,
which we find to attend the great sequences of natural Law
—the 'Cosmical Order', typified by that rainbow which the

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[1] Mansel contrasts Nature with the self-determination of the conscious
Self. 'The course of Nature is thought as uniform, because, so long as
Nature is spoken of, that element is absent which alone we can think of
as originating a change, Intelligence. And for the same reason, so long
as the several phenomena of Nature are believed to be each under the
control of a separate intelligence, the axiom of her uniformity will admit
of perpetual modification. The winds may blow north or south, as suits
the caprices of Aeolus ; Xanthus may neglect the laws of his periodic rise
and fall, to arrest the progress of Achilles ; and even the steady-going
coachman, Phoebus, may alter upon occasion the pace of his chariot, to
gratify the wishes of his roving parent' (*Proleg. Logica*, pp. 148, 149).

Visionary saw round about the Throne. The Creator hath made
the round world so fast that it cannot be moved. His decrees are
fixed.   His promises fail not.   So long as the world endureth
seed time and harvest shall not cease.   Man has his allotted
length of days. Death is the way of all the earth—*hodie mihi,
cras tibi.*   The thing that hath been is that which shall be.
The ' God of Amen ' compares His sure mercies to the covenant
of day and night and the appointed ordinances of heaven and
earth.   His righteousness standeth like the strong mountains ;
His judgements are like the great deep.   Even the wind, which
bloweth where it listeth, observes its appointed seasons, and
meteorology becomes more and more a science.[1]

§ 1066. This imposing natural security, however, is entirely
irrelevant to logical theory.   Bain, Mill, and others discuss at
length the bearing of the then newly discovered law of the
Conservation of Energy and Indestructibility of Matter upon
the Law of Causation.   But how can a discovery about the
contingent properties of outward nature—for example, those
of radium—affect an Axiom of Thought ?   For the Law of
Causality, if analysed far enough, is but the cosmical aspect of
the metaphysical Law of Self-identity.[2]   Logic cannot distinguish
between the sequence of cause and effect and the inherence of
attributes in a substance.   It is concerned only with the attri-

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[1]   Nature well known, no prodigies remain ;
            Comets are regular, and Wharton plain.
                                (Pope, *Moral Essays*, Ep. I.)
An assertion such as ' What Englishmen have done Englishmen can do '
rests on the idea of the stability of national character.

[2] No doubt, the majority of writers mean by the 'Law of Causality'
the doctrine that every event must have a cause—which, on the logical
side, is the Principle of Sufficient Reason—and employ the phrase ' Uni-
formity of Nature ' for the doctrine that the same cause is always followed
by the same effects.   But, apart from any criticism of the word ' Nature '
to cover all predication, we are left without any name for the stable
course and constant sequences of the universal frame.   And it is this fact
of permanent stability to which the Empirical philosophy appeals.   The
sequence of events has been observed hitherto to present such and such
uniformities, and there is no reason to suppose that their accustomed
course will be interfered with.   If chaotic disorder were to supersede the
present regularity, Logic for the Empirical philosopher would cease to
exist.   But no witches' frolic of confusion would make the least difference
to ours.

bution of predicates to subjects. The Inductive process rests on the assumption that each thing abides as itself, in the special and applied form of the law that a cause is always followed by its own effects, or that a substance maintains its inherent qualities. Once show that Reality being determined in this way is also determined in that way,—in other words, once establish a principle, a law, a causal connexion,—and we are sure that, apart from any counteracting event, it must always be so. As Mill puts it, 'Change can only be produced by change.'[1] Grapes will not produce thorns nor figs thistles without some very unusual grafting. Qui sème des chardons recueille des épines.

§ 1067. But this principle of Causality does not require that the course of Nature should continue stable and uniform. If, instead of the new flood of customary morn, the sun one day did not rise, it would be because something had occurred to prevent it. Our expectation that the sun will rise to-morrow is grounded not upon custom but upon our reasonable belief that no physical cause sufficient to disturb the planetary system so suddenly exists.[2] But if the universe were a chaos of conflicting forces, a whirling kaleidoscope of change, a welter of confusion, if facts lay about like a child's spillikins, still the principle that what nature a thing has it has would be in no way affected—though it would be very awkward for the logician to have no general propositions. A conflict of forces is not a flux. For a flux means that a law—including the Law of Causality itself—may be truly stated, and yet that it is not to be depended on in any given instance. Neither is Causality affected by supernatural agency. Gravitation, as a law, holds good if a man be suspended in the air by a miracle as much as if he be suspended by a rope. Nor again, if the principle of Causality (or persistence of the Truth of things) is not disturbed by Divine action, is it set aside

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[1] *Logic*, i. 407.

[2] 'The plowman from the sun his season takes.' Archbishop Thomson says :—' The inductive method proceeds in the faith that the universe— the Cosmos—will ever be subject to strict order and general laws ; and nothing has occurred hitherto to disturb a belief upon which science builds her hopes of progress—her very existence ' (*Laws of Thought*, p. 359). By this strict order, however, the archbishop means that 'under the same circumstances and with the same substances the same effects always result from the same causes ' (p. 358).

by Man's free will—that link between miracle and uniformity. Whatever the metaphysical difficulty of the ideas, yet either Will is an originating cause or we must fall back upon Necessitarianism. In either case cause produces its effects. Will, indeed, is irregular and unaccountable.[1] 'Nil aequale homini fuit illi . . . nil fuit unquam Sic impar sibi.' Byron says :—

> Nought's permanent about the human race,
> Except the Whigs' not getting into place.[2]

But though a human being were unstable as water, never for two instants in the same mind, to one thing constant never, still, granting the freedom of the Will, we cannot conceive of a change of purpose—or rather a new direction of the personality —either as determined inexorably or as fortuitous,[3] but only as spontaneous and *self-creative*. If there be no such thing as free will, *cadit quaestio*.

§ 1068. The Uniform Course of Nature, on the other hand, is a contingent fact only, not an *a priori* law. It has been said that such uniformitarianism can never be more than a working hypothesis. It is but empirically universal, a ὅτι only. The mediaeval, observes De Morgan, was never sure but that there might be men planted in the ground like Polydorus. He believed that somewhere, 'in antres vast and deserts idle', there lived

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[1] If we allow a large enough cycle, events dependent on human will may be expected to recur. In parts of British India, where female infanticide is secretly practised, the Government has been accustomed to impose a tax on districts where the proportion of male to female births exceeded the ascertained average for a certain period.

[2] Shakespeare's Biron speaks of 'vane-like men of strange inconstancy'.

[3] The Americans have a phrase, 'It just happened.' The Greeks did not regard Fortune as blind Chance, τὸ αὐτόματον, striking wildly right and left. To Anaxagoras, τύχη is ἄδηλος αἰτία ἀνθρωπίνῳ λογισμῷ—'All chance (is) direction which thou canst not see' (cf. Ar. *Phys*. ii. 4, § 8). Plato says: μετὰ θεοῦ τύχη καὶ καιρὸς τἀνθρώπινα διακυβερνῶσι σύμπαντα (*De Legg*. iv. p. 709). Pindar addresses Fortune as divine and adorable —Παῖ Ζηνὸς Ἐλευθερίου, and Σώτειρα Τύχα. Boole (*Laws of Thought*, p. 20) observes that 'the records of crime and pauperism present a degree of regularity unknown in regions in which the disturbing influence of human wants and passions are unfelt—such as eruptions, weather, epidemics, and so forth'. Yet we do not question that the most variable phenomena are really subject to regular law. To omniscience nothing is contingent and accidental; and a monstrous birth or fickle breeze is just as 'necessary' as the dawn of day.

> The anthropophagi, and men whose heads
> Do grow beneath their shoulders.[1]

Occult influences, removed from all experience, were catalogued by star-gazers and prognosticators. That nature is uniform was actually denied by the Peripatetic school, including Aristotle himself, who, says Grote, held some sequences to be irregular and unpredictable. At the most, the even course of Nature was but looked on as the expression of the stability of the good pleasure of heaven.

§ 1069. The Axiom of Causality, in the sense in which I take the expression, does not allow us to predict, except provisionally, unless we know all causes. Whereas the doctrine of nature's guaranteed permanence enables man, so far as he relies on it, to 'dip into the future far as human eyes can see', and also to reconstruct the past.

The former teaches that things will continue as they are until something occur, to alter them. The latter is the belief that nothing will, at any rate at present, occur to alter them. The one is a truth which is native to the mind. The other, so far as it is true, is a truth given in experience. But it might fail us at any moment. The forces which seem so permanent are at the mercy of other forces which we know not of. The great compacted framework of our universe might, *nutu numinis*, crumble and sink into the void; the solid earth might fail beneath our feet; the great globe itself and all that it inherit might dissolve, leaving not a wrack behind; as in that Dies Irae when 'the stars of heaven fell unto the earth, even as a fig tree casteth her untimely figs when she is shaken of a mighty wind. And the heaven departed as a scroll when it is rolled together; and every

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[1] 'Now I believe that there are unicorns' (*Tempest*). The lastingness of earth and sky is constantly appealed to in literature as the type of what is least fickle. Thus, in *Julius Caesar*, 'I am constant as the northern star.' Hermione says :—

> The sun was not so true unto the day
> As he to me.

In Scott we have the lines—

> Come one, come all, this rock shall fly
> From its firm base as soon as I.

But the same perdurance has been found in the works of men's hands— e.g. 'Quando cadet Colisaeus cadet et Roma ; et quando cadet Roma cadet et mundus' (Bede).

mountain and island were moved out of their places.' We have ourselves seen sure mountains and age-long hills melt in fiery ruin, isles disappear, cities brandished like a torch in a giant's hand, and we know that such cataclysms were not comparable to the changes that have taken place, slowly or suddenly, in ages past—

> There where the long street roars hath been
> The stillness of the central sea.

And yet though the ordered κόσμος should fall back into elemental strife, though the firmament should be folded up and changed as a vesture, the Law of laws would abide. *Ego Deus et non mutor. Ego sum Qui sum.*

§ 1070. It may be thought, however, a preposterous transcendentalism to exalt into an absolute *a priori* axiom the observed constant relation between cause and effect, substance and attribute. If we find by observation that a piece of lead sinks in water we conclude no doubt that lead will always sink in water. If a selfish person is found to be inconsiderate, we think that wherever selfishness is found inconsiderateness will be found. But, it is argued, such constancy in things is a law of things, not a formula of the Reason. The knowledge of the recurrence of sequences is contingent merely. It might have been otherwise. Mansel himself says :—

' This is a principle of contingent truth only, not of necessary truth, at least, not in the highest sense of the term. I can *suppose*, though I cannot *conceive*, that in some other portion of the universe the phenomena of matter may have no settled relations to each other, or even no relation at all. Each may be absolutely detached from, and independent of, every other. Or there may be dependencies continually changing, so that phenomena at one time and in one place connected as cause and effect may at another time or in another place have no connexion at all.' [1]

§ 1071. I venture to think that this view of the Axiom of Causality as a contingent law will not bear probing. Of course, if the Will of the Creator be pre-supposed, that Will can change water into wine or cause a human body to walk upon the waves. But this is simply to introduce a new and counteracting cause. If I fling a stone, or an earthquake hurls a mountain, into the

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[1] *Proleg. Logica*, p. 147.

air, no one supposes that the law of gravity has been made of none effect. Nor is the truth of things any the more destroyed if the modifying force be occult and supernatural. Apart, however, from the idea of an invisible Hand, or of unknown disturbing forces, the supposition of a world in which the phenomena had no settled relation to each other, and in which causes sometimes did and sometimes did not produce their effects, is impossible and unmeaning. Infinite variety of change there may be, but the changes must be governed by law. To suppose that anything should be thus or thus, and then *without any reason* not be thus, is to bewilder oneself with words. What can cause possibly mean apart from constancy of connexion with its effect?

§ 1072. The inductive process first by eliminations reduces the possible reasons for a phenomenon to one. Next, since the phenomenon must have a reason for existing, it assigns to it what has been found to be the only possible reason. No doubt a phenomenon, considered abstractedly, may have more than one cause; but in any supposed case the induction reduces the possible explanations to one. We have thus proved that a particular result is to be attributed to a particular cause, or a particular quality to a particular substance. That and no other is the truth of the existence of the subject at this moment. It exists in that manner, with that property. But if it exist so at one moment it must exist so always, *unless some new cause operate to make it otherwise.* This is its mode of being, and that mode of being cannot be reversed without some sufficient reason. In other words, causes always have the same effects. Subjects do not drop their attributes like partners in some ever-changing dance.

§ 1073. It is impossible, then, to admit that this Axiom of Causality is merely given us by Experience. Thus Archbishop Thomson observes:—

'All our experience goes to convince us that *under the same circumstances and with the same substances the same effects always result from the same causes.* This great inductive principle is itself proved by induction, and partakes of the same formal defect that may be charged against other inductive results, viz. that its terms are wider than our experience can warrant. Many groups of facts, connected as cause and effect, have not been examined; and in them it is conceivable at least that there may

be capricious causes producing opposite effects at different times.'[1]

Surely a capricious, freakish cause is really unthinkable. Ueberweg, meeting the assertion that the objective causal nexus is a circle, since the knowledge of the real nexus is based upon incomplete inductions, replies that the causal nexus as existing precedes our inductions; but the same nexus *as known to us* is a generalization from a great number of special inductions.[2] Hamilton remarks :—

'It is possible only in one way to raise Induction and Analogy from mere probability to complete certainty—viz. to demonstrate that the principles which lie at the root of these processes are either necessary laws of thought or necessary laws of nature. To demonstrate that they are necessary laws of thought is impossible; for Logic not only does not allow inference from many to all, but expressly rejects it. Again, to demonstrate that they are necessary laws of nature is equally impossible. This has indeed been attempted, from the uniformity of nature, but in vain . . . seeing that this law itself can only be discovered by way of Induction and Analogy. In this attempted demonstration there is thus the most glaring *petitio principii.*'[3]

Hamilton brings the same charge, it will be remembered, against the Syllogism.

§ 1074. Hume, Locke, Condillac, and the empirical school, explain the belief in the constancy of things by association. Mansel speaks of 'the physical Law of Causality', which he thus states :—' Every phenomenon which takes place has, among its immediate antecedents, some one fact or combination of facts, which being repeated, the same phenomenon will invariably recur '.[4] He identifies this law with the belief in the uniformity of nature. The law is not confined by him to physical phenomena; but he desires to exclude from it the self-determinations of the Will. He combats Mill's view that the Law of Causality is an induction,[5] and one of by no means the most

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[1] *Laws of Thought*, p. 358. [2] *Logic*, p. 490.
[3] *Lectures on Logic*, ii. 174. [4] *Proleg. Logica*, p. 145.
[5] Mill says that 'the principle of the uniformity of the course of nature will appear as the ultimate major premise of all inductions. . . . I regard it as itself a generalization from experience. . . . In the infancy of science it could not be known that *all* phenomena are regular in their course' (*Logic*, i. 356–8). ' It is not properly uniformity, but uniformities ' (ibid.

obvious kind. For this is to overlook the fact that, when the Law is found in apparent conflict with experience,

'it is invariably assumed to be in the right and experience in the wrong, which is not the case with merely inductive laws; to say nothing of the paralogism of making the ground and principle of all induction itself depend upon induction, and upon induction only. Our earliest and unphilosophical inductions appear as often to indicate variety in the operations of nature as uniformity. The sun rises and sets, the tide ebbs and flows, with regularity; but storm and calm, rain and sunshine, appear to observe no fixed order of succession. But, in any instance whatever of physical causation, let an apparent repetition of the cause not be followed by that of the effect, and all men alike, philosophical or unphilosophical, will at once assert that there was some latent variety in the circumstances, and not a change in the uniformity of their succession.' [1]

Nevertheless even this acute philosopher regards the Principle of Causality not as a law of thought but as an empirical principle, albeit one of a very peculiar character.

' If we were told of an instance on our own globe in which the repetition of exactly similar phenomena had apparently not been followed by the same effect, we should without hesitation account for it on one of two grounds. Either the phenomena were not exactly similar, or the interposition of some intelligent being had prevented the natural result. And if we were asked why these two alternatives alone are admissible, we should probably reply, "because matter cannot change of itself." Now why cannot we think of matter as changing itself? Because *power*, and the *origination of change*, or self-determination, have never been given to us save in one form, that of the actions of the conscious self.' [2]

It would be better to say 'things' than 'matter', which will not cover a fraction of the subjects to which attributes are ascribed. The only subject then which can change its predicates, itself unchanged, is the Ego.

p. 364). 'We make experience its own test' (ibid. p. 369). Of the observed uniformities of Nature the one with most pretension to rigorous indefeasibility is the Law of Causation (ibid. pp. 375, 376).

[1] Op. cit. pp. 146, 147.

[2] Ibid. p. 148. It is disappointing to find Professor Case in the 1902 edition of the *Encyclopaedia Britannica* asserting that 'few men have believed in uniformity, but all have induced from particulars to universals'. 'The theory of Mill,' he remarks, 'need not detain us long. Most inductions are made without any assumption of the uniformity of nature. For

§ 1075. If the foregoing account of the relation of Induction (as a special application of inference) to pure Logic be correct, the 'possibility of bringing new truths out of old' need not have been, as Mill says it is, 'an eternal mystery and stumbling-block to Formal Logic.'¹ Anything really *new*, and not merely explicated, in the truths must of course be given by experience and insight, not by ratiocination, and the materials for the detection of a law must be selected and arranged by the Intelligence which judges rather than by the Reason which infers. But, the 'interrogation of nature' completed, and the result subsumed under the Axiom of Causality, the proof of the inferior universal, the generalization from the facts, takes place by a valid and inexpugnable logical illation. There is no need to 'catch the mantle of the prophet' for this part of the process.

§ 1076. Scientific Induction is something more than Kant's 'Syllogism of the Judgement'. What the Judgement does is to compare, analyse, and decompose the presentations of experience, and deciding which circumstances are· material hand its results over to the syllogistic mill to grind. A single ἔνστασις stops it. *Una instantia cadit inductio.* Gainsborough is said to have painted the 'Blue Boy' to disprove Sir Joshua's teaching that blue should not be the dominant note of a picture.

§ 1077. 'The notion of Cause is the root of the whole theory of Induction.'² In this and in his other saying that the 'Uniformity of nature'—meaning the constancy of law—'is the ultimate major premise of all inductions'³ Mill goes to the heart of the matter. Proof of the general from the particular, then, has an element of pure form, and is a syllogism whose elements are the Axiom of Causality and sifted experience.

whether it is itself induced, or *a priori*, or postulated, this like every assumption is a judgment, and most men are incapable of judgment on so universal a scale when they are quite capable of induction.' Yet in the same article the President of Corpus rebukes Dr. Bradley for supposing that the major premises of our reasonings must necessarily be explicitly formulated in our mind.

¹ In the same way Dr. Case, asking 'how from some particulars of experience do we infer all universally?', avers that 'the answer to this question is still a *desideratum*' (ibid.). But one fact cannot prove another ; nor can any mere string of facts, 'with power to add to their number,' give us a universal, unless there is a greater universal in the background, viz. here the Axiom of Causality.

² *Logic*, i. 376.   ³ Ibid. p. 356.

Mill, in spite of his disparagement of syllogism, is nearer the truth than the scholastic logicians, who, from the Peripatetics onwards, overlooked the true nature of epagogic reasoning.

§ 1078. Aristotle says distinctly that the method of proceeding from a number of similars to a general uniformity is through a minor term consisting of *all* the instances. ἡ γὰρ ἐπαγωγὴ διὰ πάντων.[1] Though they be innumerable as leaves in Vallombrosa or as the pebbles on the 'unnumbered beach' of Chesil, every instance must be examined : otherwise the inference will be but ἐπὶ τὸ πολύ, probable, but nothing more. The only 'pure' induction, says De Morgan, is *per simplicem enumerationem ubi non reperitur instantia contradictoria*.[2] Every bead of the inductive rosary must be told. Any other discovery of laws is 'beyond the province of formal logic' and only called logical induction 'by a confused use of language'. And yet the result of a complete enumeration is not a law but a mere fact. It is not, All *X*'s are *Y*, but, All the *X*'s are *Y*.

§ 1079. According to Aristotle, the Inductive syllogism proves the major of the middle term by means of the minor—

Every *M* is *P*	Every *M* is *P*	Every *M* is *P*
S is M	S' is M	S'' is M
Therefore S is P.	S' is P.	S'' is P.

Retracing our steps, we prove the universal, Every *M* is *P*, by ascertaining that *S* is *P*, *S'* is *P*, *S''* is *P*, &c. *S*, *S'*, *S''*, &c., are each of them *M*. But do they together make up all *M*?[3] To take Aristotle's example, longevity (τὸ μακρόβιον) has to be proved to accompany absence of gall (τὸ ἄχολον) by means of a number of gall-less animals which are ascertained to be long-lived.

> All these observed animals are long-lived.
> All of them are without a gall.

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[1] *An. Pr.* ii. 23, 68ᵇ15.

[2] Such 'Inductions', lacking all abstract character, unless a summary has it, are mere *matter*, whereas the true causal universal is a blank *form* waiting to be filled up.

[3] Devey (*Logic*, p. 149) gives it thus :—

Deductive.	Inductive.
b is *a*	*x*, *y*, *z*, are *a*
x, *y*, *z* are contained in *b*	*x*, *y*, *z* represent the class *b*
∴ *x*, *y*, *z* are *a*.	∴ *b* is *a*.

This is in the Third Figure. But we cannot conclude that all gall-less animals are long-lived, unless we are further certain that the animals enumerated exhaust the long-lived class. The whole and the parts must be absolutely convertible. The constituent species must together make up the genus. The summed individuals must constitute the universal. If we are not sure of this, a particular and probable conclusion alone is possible, and the Induction is called Imperfect. 'An Induction,' says Hamilton, 'is an enumeration of the parts in order to legitimate a judgement in regard to the whole.'[1]

§ 1080. An 'Imperfect induction', then, is such a one as the above, where we are only entitled from the premisses to conclude that *some* bile-less animals are long-lived, affording a 'philosophical presumption', greater or less according to the number of cases examined, that all are so. Hamilton, Veitch and others, however, give the name of Imperfect Induction to a syllogism in the following form :—

> This, that and the other magnet attract iron.
> This, that and the other magnet *represent* all magnets.[2]
> Therefore all magnets attract iron.

If we substitute *are* for *represent*, it is, as they call it, Perfect Induction. But if these do represent all magnets, the conclusion is not probable but certain. The premiss may be inaccurate, but how can the logician know that ? If on the other hand 'represent' means 'are instances of', the universal conclusion is unwarranted. No, it may be said, they are more than instances ; they are samples, and in that sense representative. But ' This, that and the other magnet are samples of all magnets ' should mean not that they are taken at random from a pile of objects called magnets, but that all such objects are known to have the same characteristic properties. We know, then, already that all magnets attract iron. Or, finally, the Induction may be asserted

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[1] *Lectures on Logic*, ii. 167.

[2] Aldrich describes Formal Induction as a kind of enthymeme in *Barbara*, with the minor premiss suppressed—' This, that and the other magnet attract iron ; therefore all magnets attract iron '—understand, ' All magnets are this, that and the other magnet.' Whately, on the other hand, states the syllogism as though there were a suppressed major premiss,—' Whatever is a property of this, that and the other magnet is (certainly or probably) a property of all magnets. Attracting iron is a property of this, that and the other magnet. Therefore,' &c.

to be imperfect if we take 'represent' to mean that there is a *general* similarity between these particular magnets and all other magnets.   From the general similarity we infer a probable resemblance also in the property of attracting iron.[1]   But the question what right we have to infer from a general similarity to a hitherto unascertained resemblance is the problem of Induction. Because forty-nine shillings on my table lie head upwards, what right have I to assume that the fiftieth does so ?   Is there not a danger of undistributed middle ?   Forty-nine shillings lie face upwards.   This is an exactly similar shilling.   Then this does so.   The logicians, no doubt, unable to escape from their narrow round of physical generalizations, are thinking, as usual, of natural kinds.   Hamilton states the major premiss of what he calls Material or Philosophical Induction thus :—

'What is found true of some constituents of a natural class is to be presumed true of the whole class (for nature is always uniform).'

This is the old ambiguity—'uniformity of nature' being made to mean not constancy in the relation of cause and effect, but the homogeneity of coexistences and the grouping of things according to their inner nature in permanent natural classes.   But the logician as such knows nothing of natural classes.   As far as he knows, sows' ears might become silk purses.   There is a story of a countryman who, thatching a cottage in a thick fog, could not see or feel where the roof ended, and proceeded to thatch the fog.   That man was a true logician, for how can mere logic decide where classes of things end or where begin ?   That is for the natural philosopher.   It is the latter who gets the judgements ready for the logician to syllogize with.

§ 1081. The Aristotelian Induction, then, is a mere marking of time ; it carries one no further.   Bacon calls it a childish affair, ever at the mercy of a contrary instance.   It assumes the

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[1] '*This, that and the other magnet represent all magnets* is founded on the principle that nature is uniform and constant, and, on this general principle, the reasoner is physically warranted in making a few parts equivalent to the whole.   But this process is wholly incompetent to the logician.   The logician knows nothing of any principles except the laws of thought' (Hamilton, *Lectures on Logic*, i. 320).   Hamilton obviously understands by uniformity of nature a physical law or fact, not the axiom on which logical Induction is based.

real induction as already made, whether that be a quantitative accumulation of instances or a qualitative selection of instances so as to exhibit a general law. The element of illative proof in the inductive process must be logical and formal. And upon the *data* this leads to certainty, not to probability.[1] But this formal process is not the barren 'perfect' induction of the old logicians. It is, as already explained, the application of the Axiom of Causality as major premiss to the successive hypotheses about the cause of a phenomenon X, which (by the principle of Sufficient Reason) must be found somewhere among the antecedents or circumstances of X, viz. a, b, c, d, e, f, &c. Each of these in turn is subsumed hypothetically as minor term under the Law of Causality. Is it b that caused X? Then it must always have X as an effect. But on examining another case in which b occurs as antecedent it is not found to be followed by X. Similarly with c, d, e, &c. Therefore none of these was what caused X. Then by exclusions a is left in, as the only possible explanation of the phenomenon X. But it would have been simpler and shorter, instead of excluding the possible causes one by one, to observe whether the phenomenon X follows when all the antecedent circumstances *except one*, e. g. a, remain as before; whether, that is, its cause is to be found *somewhere* in b, c, d, e, f, &c. Thus, to take the former illustration, the feeling of warmth is seen to be due to the direct rays of the sun by our simply stepping into the shade. Every other antecedent remains the same except the one. This is the

[1] Krug remarks: 'By the processes of Induction and Analogy a great probability is all that we can reach, and this for the simple reason that it is impossible, under any condition, to infer the unobserved from the observed, the whole from any proportion of the parts, in the way of any rational necessity. Even from the requisites of Induction and Analogy it is manifest that they bear the stamp of uncertainty; inasmuch as they are unable to determine how many objects or how many characters must be observed in order to draw the conclusion that the case is the same with all the other objects or all the other characters' (*Logik*, § 168; quoted by Hamilton). Hamilton himself remarks that 'a competent number of cases must be observed, but how many it is impossible to say in general. It depends on the difference of essential and unessential characters. The difference of essential and accidental is, however, one itself founded on induction' (ii. 169). So useless is the Aristotelian Enumerative Epagogy. The real difficulty is not how to infer from the observed, but how to observe and select.

Method of Difference, for which a single case suffices. The only question is whether we can be sure that every antecedent but one is the same.[1] We proceed then to verify the generalization at which we have arrived, that a will invariably be followed by the effect X, by examining a number of cases in which a occurs. If we find that it is in every such case followed by X, our belief that it is the cause of X is much strengthened.[2] The formal defect of this, the Method of Agreement, is, as already stated, that in itself, owing to possible plurality of causes, it is merely enumerative and empirical, and since every case of a cannot be examined it only yields a probability. The instances, *numerantur non ponderantur*. The so-called Formal Induction of the logical books is based on Agreement, which, if rigorous enough to prove, ceases to be inductive.

§ 1082. Practically, the surmise that a is the cause of X is often arrived at by a flash of imaginative insight, by which a mind trained and exercised in the analysis of phenomena pierces suddenly to the heart of things and detects the One in the Many, the law in the facts.[3] Such master minds, having

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[1] One to whom it was said: 'Your father died in battle, your grand-father and great-grandsire also; are you not afraid to go into battle?' replied:—'Your father died in bed; your grandfather died in bed; and your great-grandfather died also in bed. Are you not afraid to go to bed?'

[2] The point of agreement may be not itself the cause of the phenomenon, but an indication of a cause less easily exhibited. Thus the *Spectator* has contended (June 16, 1900) that 'The drinking races have not only conquered, but have moralized, the world. The Jew drank and gave us monotheism; the Greek drank and gave us literature and art; the Roman drank and gave us law; the Teuton drank (hard) and gave us the passion of freedom.' On the other hand Hindoo and Arab have done little for the world. It is not of course suggested that drinking habits themselves benefited mankind, but the character with which they have been coupled.

[3] 'It was Bacon's boast that Induction, as applied to nature, would equalise all talents, level the aristocracy of genius, accomplish marvels by co-operation and method, and leave little to be done by the force of individual intellects. This boast has been fulfilled' (Hamilton, *Lectures on Logic*, ii. 138). It is astonishing that Sir William should not have observed that the boast has been entirely falsified. The giants of genius have played as great a part in later Natural Science as the captains of industry in modern commerce. The appropriate conception is often discovered by what seems at first sight a kind of accident. Whewell says :—' Such events appear to result from a peculiar sagacity and felicity

obtained their general principle not by a slow process of exclusions but by a rapid intuition, proceed to verify it deductively. This is so in matters of common life as much as in speculative research. The man of masculine common sense is not he who never sees beyond his nose, but he who by quick perception rejects what is immaterial, and fastens on the root of the matter. *Rem acu tetigit.* It was said critically of an eminent modern statesman, 'He has no intuitions.' He saw too many aspects of every question, and saw them disproportionately.

§ 1083. On the other hand, though inquiry into the reason of a thing (τὸ διότι) is an inquiry into its essential nature (τί ἐστιν;), yet I must repeat that the phenomena with which Logic deals are all things that happen, not only those organic *genera* or kinds which have a fixed constitution and clearly marked essence. The reason why the train went off the line is because a boy put a stone on the rail. The reason why I laughed is because you said something amusing, or looked so serious. The reason why the lady put up her umbrella was that she felt a drop of rain. The inductive 'search into the system of Reality', the ascent to ever higher concepts, the unravelling of the tangled web of causes and effects, the scientific pursuit of Truth—*vere scire est per caussas scire*—, this is not for the mere logician, who leaves to others the tracing of the orderly development of the universe, through a gradation of essential conceptions, from formless matter to matterless form. The 'Logic of rational belief' is not Induction employed upon one department of things, that which is commonly called Nature, but upon all.

§ 1084. The Stoic School endeavoured to make Logic an instrument of physical inquiry. Abailard and his followers had the same aim in the Middle Ages. This, however, is not to widen logic but to narrow it. The investigation of physical nature is but a small part of human inquiry, and presents a much

of mind—never without labour, never without preparation ; yet with no constant dependence upon preparation, upon labour, or even entirely upon personal endowments.' Darwin tells us how, his mind being already prepared by long observation of the habits of plants and animals to appreciate the universal struggle for existence, the idea of the tendency of favourable variations only to be preserved came into his brain in reading Malthus on Population. 'Here then I had at last got a theory by which to work' (*Life and Letters*, vol. i, Autobiog. Chapter).

easier and simpler problem to the logician than the extremely
complicated phenomena of politics, ethics, and conduct gene-
rally.   Every moment of our lives we are building up inductions—
the child that is learning to lisp its mother tongue as much as
the savant deciphering an unknown hieroglyphic; the beggar
judging by faces from which passenger to expect a penny, the
man wondering why his friend does not write, or what is the
explanation of his shares going down, or putting two and two
together about anything else, great or small, from Free Trade
to the weather, as much as the student establishing the author-
ship of a Shakespearean play by the line endings and syntax.
The illustrations of the Inductive Methods given in the logical
books disguise the extreme complexity of most of the actual
problems presented to human minds.   They also encourage
a misleading belief that Logic is only justified by the assistance
it gives to mankind in subduing Nature and extending the
boundaries of useful Knowledge.[1]   The difficult inductions of the
vulgar, moreover, are usually quite as correctly formed as the
comparatively simple ones of the learned.   Where men go
wrong is not through want of logic but through ignorance, pre-
judice and mal-observation.   It is their materials which are
their difficulty.   They compare and judge wrongly; they select
and arrange the facts unintelligently and unmethodically; they
think they have all the material facts before them when this is
far from being the case.   But the grinding of the mill of Reason
is performed almost mechanically.   It is the understanding, not
the rational faculty, which errs.

§ 1085. The usefulness of Inductive analysis is chiefly disci-
plinary and educational.   Veitch, however, remarks :—

'As to the value of the rules of Induction in the matter of
culture, they are wholly secondary as compared with the high
abstract training, the precision of logical thinking, the orderli-
ness of thought, the power of consecution, which are developed

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[1] Ramus complained that he had given himself to the study of the
'Organon' for a decade without becoming a better geographer or a wiser
historian (see *Animadversiones in Dialecticam Aristotelis*, i. iv).
Edmond Mariotte (ob. 1684) was one of the first to 'enlarge' the Aristo-
telian Logic by engrafting upon it experimental methods.   He considered
this new calculus to be a supreme and universal science, related to the
other sciences as algebra to mathematics (*Essai sur la logique*, qu. Devey,
Logic, p. 17).

by the study of Formal or General Logic. Compared to this' their influence is weak and unsteady, as is the swaying chaos of fact in the world compared with the grasp of the universal laws which regulate concepts, propositions, and reasonings. And while in the world of physical phenomena—definite, visible, tangible, or to be reached by microscope or telescope—they are valuable and important, they cannot for a moment be placed on the same high level as those laws which regulate all human thinking in its very essence, its very possibility—which form, in fact, the conditions of any concept, any judgement, any reasoning whatever. These are the first things to be studied, and the man who knows not these in their grounds and basis is, whatever he may know of rules applied to so-called phenomena, a mere empiric.'[1]

§ 1086. Philosophy is the loser not the gainer by confusion between Reason and Experience, between the necessary connexions of thought, the rational consequences of *data*, on the one hand, and the objective connexions of empirical beliefs on the other. The mind, it is often contended, must aim at actual, not at merely relatively valid, truth. That may be so ; but it must not aim at it in logical analysis. Methodology, we are told, should be regarded as the special, final and chief aim of science. Sigwart, however, says, 'of *our* science,'[2] which in the interests of scientific thought must be strenuously denied. Those who ask not merely for stability and consistency in our thoughts but for the thoughts themselves, or for the arrangement of the thoughts, must go elsewhere than to Logic, which supplies nothing more than a conditioned necessity, ἀνάγκην ἐξ ὑποθέσεως. It is true, as Sigwart observes, that 'All real learning is mediated judgement'.[3] The Socratic Maieutic went further, and, maintaining that there is no such thing as learning, nothing but recollection, was 'content to call into consciousness the ideas of subject and predicate by means of questions'.[4] But the *materials*, whether gained by experience or by ἀνάμνησις, *and their marshalled order* also, must be given and provided, Reason conducting the mediating process formally only.

§ 1087. However far back you push the bare deliverance of consciousness, the sensible which is not yet the intelligible, you must come to it sooner or later for any synthetic extension of

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[1] *Institutes of Logic*, pp. 482, 483.   [2] *Logic*, i. 21.   [3] Ibid. p. 113.
[4] Aristotle says:—πᾶσα διδασκαλία καὶ πᾶσα μάθησις διανοητικὴ ἐκ προϋπαρχούσης γίγνεται γνώσεως (*An. Post.* i. 1).

your knowledge. The intelligence has built the predicate out of previously experienced *hoc aliquids* before it can judge that any intuition falls under it as subject, that This is of such a kind.[1] But Logic guarantees neither the reality of the intuition nor the truth of the comparison. It is impossible then to agree with those who, like Sigwart, hold that 'Logic proposes to set forth those Criteria of true Thought which are due to the demand for necessity and universal validity', with the explanation that 'in necessary and universally valid Thought knowledge of the Existent is included'.[2] Logic cannot tell which predicates are grounded in the permanent nature of their subjects, disengaging the constant element from casual and varying connexions. Even mathematical and metaphysical necessity are foreign to its analysis, and accepted by it as given. Sigwart admits this. He says: ' Logic declines to give any judgement as to the necessity and universal validity of the premises from which we start at any time. Observance of logical rules ensures merely the *formal correctness* of the procedure and not the *material truth* of the results.' Yet by what rules we may have certain knowledge of a knowable Existent, and how Thought correctly mediates the perceptions of an external world, in what way human Thought, whose end is the preservation of our well-being, shall avoid missing its aim and falling into error, this he conceives to be the province of logical inquiry. Logic, in his view, which is the usual one, is a discipline which guides and directs Thought, regulating Thought's procedure, and partially including the art of correct observation. In other words Logic directs us how to judge, not limiting itself to 'judgements of subsumption to the exclusion of the mere communication of facts ', the conditions of validity challenging logical investigation in the one case as much as in the other. Sigwart appeals to Aristotle's definition of judgement as implying truth or falsehood.[3]

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[1] The Subject is thus first in consciousness, the Predicate idea only second. Judgement, as Bradley observes, predicates an idea of a reality, a *what* of a *that*. But the *what* has been formed by the intelligence out of *thats* given by sensation and stored up by memory.

[2] *Logic*, i. 8, 10. A recent writer well observes that there is no half-way house between regarding the whole question of existence as irrelevant to Logic and pursuing metaphysics to the bitter end.

[3] (Λόγος) ἀποφαντικὸς οὐ πᾶς, ἀλλ' ἐν ᾧ τὸ ἀληθεύειν ἢ ψεύδεσθαι ὑπάρχει, *De Int.* 4.

Thus guided by Logic, 'we proceed in Thought from given *data* in such a way that each step shall be accompanied by the consciousness of necessity and universal validity.' [1]

§ 1088. But the rightness of a judgement is more than formal correctness. It is correspondence to the reality of things. And a Logic which takes cognizance of such correspondence deals with the matter of our thinkings and not only with their form. Sigwart takes an example from the rule of Conduct—

'Before the court of Conscience the only evidence we have as to whether the Thought which guides our action has attained its purpose or not is the inner consciousness of the *necessity of our Thought*, the *certainty* that the given mode of action follows from the general rule ; the *self-evidence* which satisfies us that it was right and good to act so under the circumstances because the general principles of justice and morality demanded it.' [2]

If, however, the necessity of application of rule to case [3] were merely a matter of 'formal correctness' it would be easy enough. The difficulty lies in judging about the facts, in deciding whether the circumstances have all been reviewed and none forgotten, overlooked or misapprehended, and in knowing whether to trust the final verdict of the moral sense. The hesitation whether my conduct ought to conform to a given rule resides, in a word, in the infirmity of the Faculty of Comparison. That infirmity lies outside the logician's cognizance.

§ 1089. 'Let us labour,' said Pascal, 'to think aright; this is the foundation of morality.' [4] Logic, however, is only a negative condition of right thinking. It compels us to think connectedly and rationally. It is concerned not with the well-being of Thought, but with its right to come into existence. [5] It is

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[1] Again, he correctly describes the logical synthesis as ' a synthesis of ideas into unity . . . not in the sense of agreement with external reality, but in the sense of the logical necessity of their synthesis '.

[2] *Logic*, i. 5.

[3] Whately rightly complains of the vagueness of the use by logical writers of the word Induction, 'which is sometimes employed to designate the process of investigation and of collecting facts ; sometimes the deducing of an inference from those facts. The former . . . is not a process of *argument*; the latter again *is* an argumentative process ; but then it is, like all other arguments, capable of being Syllogistically expressed.' There cannot, the Archbishop insists, be a process of Reasoning distinct from Syllogism (*Essay on the Province of Reasoning*).

[4] *Pensées*, Pt. I. Art. iv. § 6.   [5] See Hamilton, op. cit. ii. 3.

incompetent to find appropriate conceptions wherewith to colligate facts. But it insists that everything implicit in a conception may be stated explicitly as a fact.

§ 1090. Suppose I am at a loss to account for the high death-rate of health-resorts. Inductive reasoning connects the phenomenon with the circumstance of this, that and the other town being resorted to for health, as effect with cause. In another set of cases the same kind of reasoning obliges us to connect a high death-rate with insanitary conditions. Here is a puzzle, till the logician bids me analyse my conceptions by my intelligence. Bad drainage and numerous deaths are easily associated. What, on the other hand, is a health-resort? Clearly a place to which people resort for health? What kind of people? Intelligence answers, ailing people. A health-resort, then, is a place crowded with unhealthy people. And unhealthy people die, even at a dusty spa or in a seaside lodging-house. Reason, i. e. the logician, now again steps in and draws the inference. And Plurality of Causes accounts for the same phenomenon appearing under such opposite circumstances.

If mortality is said to be greater among moderate drinkers than among total abstainers, Logic is about to draw an obvious conclusion; but first it begs Intelligence to make sure what it means by its terms. It may turn out that many call themselves moderate drinkers who are moderate drunkards. In the same way, convictions for crime may in a certain district be remarkably few. But it does not follow that criminals are few till we are certain that witnesses will come forward, or that juries are not terrorized. Again the fact that fewer children are now sent to gaol than formerly does not prove that juvenile morality is higher; for it may be that they are sent to reformatories or otherwise dealt with.

§ 1091. In these and like cases the respective provinces of Reason and of the Understanding are clear. How illusory, again, are inferences based on statistics, and (it must be added) on history. For we know that nothing is so deceptive as figures —except facts, seeing that the record of ninety-nine important facts out of every hundred has perished.

§ 1092. Before leaving the subject of Induction something should be said about Analogical Reasoning. Analogy has been

defined as induction from a single instance, in which the absence of number is compensated for by the high degree of resemblance. But the points of resemblance must not be isolated.

The differences between Analogy and ordinary Induction, however, are superficial. Induction, to explain a fact, tries to arrive at a general principle. 'These be her very C's, her A's, and her T's.' It follows (from comparison) that the handwriting is Olivia's. This child has diphtheria. So have others. They all drank milk from a certain dairy. That then is the cause. Analogy, on the other hand, appears to be scarcely conscious of any general law, and argues (seemingly) from particular to particular.[1] Of this nature is case law, based on precedents. It is as though we argued affirmatively in the Second Figure—

> This thing which has the characteristic Y is Z.
> X is Z.
> Then X (probably) has the characteristic Y.

This union of physical parts in which the welfare of the whole is affected by the welfare of each part is an organic body.

The Church is revealed as an organic Body.

Then in the Church (we may conjecture) if one member suffer all the members suffer with it.

§ 1093. The analogy—though this is more properly induction— might, no doubt, be from a number of instances to a further instance; as, if Mercury, Venus, the Earth, Mars, &c., being opaque bodies, are planets, we presume that Jupiter also, being a planet, is opaque. In such cases a general law is directly suggested. But when the inference is from an otherwise unique instance to another like it, the law, though in the background of

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[1] 'Mr. Mill remarks that the syllogistic form of inference, from generals to particulars, which supposes that each induction is made general, is "a collateral security for the correctness of the generalization itself". It increases the sense of responsibility on the part of the reasoner by letting him know that his inference to one individual must equally apply to a large host of individuals. A common device for checking a rash inference is to point out the extent of the consequences involved. . . . If an induction is unsound, the making it general is likely to suggest contradictory instances' (Bain, *Logic*, i. 213). 'Analogy represents a phase of thought in which we no longer count but weigh the examples. . . . It might be said therefore that it is a material and not a formal inference' (Bosanquet, *Logic*, ii. 90). On the contrary Analogy is formal as far as it goes. It does not compel belief, but recommends and supports it when created. So does Induction.

the reasoning faculty, is unlikely to be made explicit.[1] Thus a harvest field is, taken as an entire picture, unique. But in the sphere of ghostly things a phenomenon, equally unique, resembles it—the Kingdom of God. Parabolically, then, we argue direct from the one to the other. There is no need to formulate a general principle, or logical conception, under which these two solitary cases are to be brought; but—'The Seed is the Word'; 'The Word is the Seed.' 'The reapers are the angels'; 'The angels are the reapers.' 'The good ground' (of soil, or of heart) 'brings forth some thirty, some sixty, some an hundredfold.' Or again, there is only one spiritual thing like a drag-net cast into the waters and gathering fish of every kind, of which the bad are cast away and the good kept. In fables again, as the Wolf and the Lamb, or the Dog in the Manger, we have a complete story or set of facts with its analogue. Bishop Butler's *Analogy of Religion, Natural and Revealed, to the Constitution and Course of Nature* expounds laws in the spiritual world which are the counterpart of observed natural laws. The difficulties which beset belief pertain to both. It is the 'kill or cure' method of argument.

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[1] Professor Case says that the types of Induction and of Analogy are respectively these :—

Induction.	*Analogy.*
S is P	S^1 is P
Every M is similar to S	S^2 is similar to S^1
Therefore every M is P.	Therefore S^2 is P.

He combat's Bradley's contention that 'Similarity is not a principle which works. What operates is identity, and that identity is a universal.' For, says Bradley, the moment you observe that this magnet attracts iron you *ipso facto* know that every magnet does so, and all that remains is for deduction to identify a second magnet as the same as the first, and conclude that it attracts iron. Prof. Case denies this, remarking that 'The basis of Bradley's logic is the fallacious dialectic of Hegel's metaphysics, founded on the supposition that two things which are different but have something in common are the same'. It follows that a man is the same as a man-of-war, and all things are the same thing (*Encycl. Brit.*, 10th ed., art. 'Logic'). Both views appear to be somewhat crudely expressed. We do argue from similar to similar, but we must first satisfy ourselves that the point of resemblance—in the case of Analogy not a mere point but an order of things—is probably the cause of the phenomenon. There might be similarity in other respects, yet no inference be possible. We have to establish an identity in the one essential respect, and this, demonstrated of a single instance, is a universal.

§ 1094. In Analogical Reasoning then we do not generalize from a number of instances which may have only one material circumstance in common—like the people who all got their milk from the same dairy—, but comparing two things which are in a number of important *inter-related* circumstances constituted alike, in other words two *systems*, we venture on the conclusion that a property possessed by the one, and which seems to flow from its general constitution, is possessed also by the other.

Even, however, if we are quite sure that the characteristic is a derivative property, yet because the two systems are only *alike*, and not the same, we cannot be certain that the cause, the *fundamentum relationis*, which produces an effect in the one is not modified by the circumstances which differentiate the other. The spheres of Nature and of Grace, for instance, are profoundly different, whatever analogies exist between them. Again, there is an analogy between the cooling of love and the cooling of an igneous body. Yet it would be rash to infer, because a planet becomes more solid and firm as it gets colder, that affection and devotion do so likewise.

§ 1095. Hamilton, following Kant, says :—

'In Induction we look to the one in the many ; in Analogy we look to the many in the one. And while in both we conclude to the unity in totality, we do this in Induction from the recognized unity in plurality, in Analogy from the recognized plurality in unity. Thus, as induction rests upon the principle that what belongs (or does not belong) to many things of the same kind belongs (or does not belong) to all things of the same kind, so analogy rests upon the principle that things which have many observed attributes in common have other not observed attributes in common likewise.'[1]

[1] *Lectures on Logic*, ii. 166. 'It would be an analogical inference to conclude that a disease corresponding in many symptoms with those observed in typhus corresponds in all, or, in other words, is typhus ; whereas it would be an induction to infer that a particular symptom appearing in a number of typhus patients will appear in all' (*G. Croom Robertson*, art. 'Analogy' in *Encycl. Brit.*). The Grote Professor rightly considered, however, that the distinction does not go below the surface. The former case might be a good induction, and the latter a mere analogy. If there is no ground for a good induction there can be no ground for a particular inference either. Robertson held with Mill that Induction and Analogy only differ in respect of their degree of evidence. Analogy cannot prove a causal connexion between the inferred properties and the common characteristics of universal

§ 1096. For Analogies do not always run on all fours. 'Every parable halts.' It is sufficient if the causal rather than the casual connexions are parallel. In fables, gnomic sayings, and parables the main point, the 'moral', alone is looked to. The parables of the Unjust Judge and the Thief in the Night are instances of this. In an Allegory, like the *Pilgrim's Progress* or the *Faery Queene*, a parallelism worked out too exactly and conscientiously would get upon the reader's nerves. Bunyan's detailed identification of Talkative with the hare of the Mosaic code is an instance. Far more is this the case with metaphors or even similes. Such as Pope's

> Eternal smiles his emptiness betray,
> As shallow streams run dimpling all the way—

or Bacon's 'Money is like muck, not good except it be spread'. The resemblance must not be too ingenious. Having touched the sentence with suggestiveness the allusion flits away and is seen no more. There is a deep mystery in the good tree bringing forth good fruit, but not in 'Your life is a vapour'—*vita fumus*—or a shuttle, or a voyage, or a stage-play, or in 'Ephraim is a cake half turned', in the besom of destruction, or the fly in ointment. In Latin countries, where riots quickly arise, they say, 'Rain is the best gendarme.' Hobbes says, 'Words are the counters of wise men and the money of fools.' Socrates argued that, as the human body is animated by a consciousness, so the material universe, the system and frame of things, must be. This is an analogy. But 'fluctus populi fluctus maris' carries us no further; nor 'amor, ut pila, vices exigit'; nor Petrarch's 'Il giorno la sera, la vita loda il fine'; nor yet the Psalmist's comparison which speaks of fruitful valleys as laughing and singing. In fact, Metaphor transfers to one object conceptions which belong to another resembling it. Shakespeare

application. It can only show that they are not incompatible.' Science resorts to analogies provisionally. In common life Analogy is relied upon greatly for the guidance of conduct. But the mind, in its eagerness to bring things together, is apt to overlook material dissimilarities. The danger of False Analogy is especially great when the things compared do not belong to the same natural classes, but are alike only in some internal relation of each to another thing of its own kind. 'The legs of the lame are not equal: so is a parable in the mouth of fools' (Prov. xxvi. 7).

says of a lady, 'She speaks poniards; every word stabs.' Death
with him is a ' fell sergeant, most strict in his arrest'. Tennyson,
very finely, calls eyes of pure women 'wholesome stars of love'.
This poet is fruitful in similes—the dainty nose 'tip-tilted like
the petal of a flower', or the feigned lady's handwriting (early
Victorian)—

> In such a hand as when a field of corn
> Bows all its ears before the roaring East—

besides his many grave and noble similitudes. Milton's com-
parison of Satan's sleeping followers to the autumnal leaves
lying thick in an Italian valley will spring to the mind, or his
humorous lines on Hobson the carrier, how Death—

> Thinking now his journey's end was come,
> And that he had ta'en up his latest inn,
> In the kind office of a chamberlin
> Showed him his room where he must lodge that night,
> Pulled off his boots and took away the light.
> If any ask for him it shall be said,
> 'Hobson has supped, and 's newly gone to bed.'

But when we think of the grave as a lodging-house, a *deversorium*,
we do not necessarily extend the analogy to the chamber candle-
stick.   If we call a camel the ship of the desert no image of
masts and spars comes into the mind.   Sometimes a simile is
reciprocal—a brow is arched, and an arch is 'a hoary eyebrow';
we speak of a clouded face, and of a scowling or frowning sky;
of a 'scolding hinge' and a temper that needs oiling; or youth
is life's springtime, and May is the year's 'sweet seventeen'—

> *O juventute, primavera della vita;*
> *O primavera, juventute dell' anno!*

When Shakespeare speaks of 'the bubble reputation', he
means its iridescence, as well as its lightness and quick bursting.
Still, that is accidental.   Reputation might be called a bubble,
even though a bubble had no colour.   Lowliness might be
young ambition's ladder, even if the successful man, once
mounted, did not kick away the degrees by which he did ascend.
It is only in the regular analogy that from the presence of
a congeries of resembling qualities we can surmise others.   On
the other hand, though Metaphor is not argument, it may, as
Mill says, suggest that an argument exists, and be useful for
expository purposes.   A single word will sometimes flood

a subject with light. Thus, the ruler of a state is a *gubernator*, or helmsman.

§ 1097. Analogy thus presumes the existence of well-defined classes of things and groups of attributes. It implies that objects have an internal constitution. But, as we have seen, logical inference cannot assume these coexistences. The circumstance that two things have ninety-nine attributes in common affords no logical ground for concluding that they have the hundredth, unless it is reasonably supposed to be derivative. If two saucers are exactly alike in make and one is cracked, that affords no presumption that the other is cracked. Yet it may be presumed, therefore, that the other is fragile. But Mansel is wrong in saying of Analogy that while (quoting Butler's Introduction) its *moral* force varies 'from the highest moral certainty to the very lowest presumption', its '*logical* value is zero'.[1] Moral presumption implies material knowledge; but there would be no presumption if it were all knowledge and no logic. Experience and reflexion prove that there is such a thing as parallelism, and if the parallel goes as far as we can see we may presume it goes further. Yet it would be ludicrous if we expected giants to 'talk big', and to use only sesquipedalian words.

§ 1098. 'Analogy' is for Aristotle proportion, or parity of ratios (ἰσότης λόγων). As 3 is to 7 so is 15 to 35. Such a quantitative relation, however, in the modern Analogy takes a qualitative form. What parliament is for the nation, a parish council is for the parish. What the safety-valve is to an engine, the same relation, it may be said, is borne by platform oratory and the newspapers to the State machine, which works in spite of popular institutions rather than because of them. The intelligence is the eye of the soul.[2] Aristotle usually speaks of Example

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[1] Butler puts the question 'Whence it proceeds that *likeness* should beget that presumptive opinion and full conviction which the human mind is formed to receive from it' (*Introduction*). The Twelve failed to argue from the feeding of the five thousand in the wilderness to their Master's ability to feed the four thousand, or to still the storm. 'Their heart was hardened' (St. Mark vi. 52, cf. St. Matt. xvi. 8–10). On the other hand there may be a credulous eagerness to analogize, like that of Hazlitt, who fully believed that the Duke of Cumberland had murdered his valet, in spite of overwhelming evidence to the contrary, because, he said, all the princely Houses of Europe had the instinct of murder in their blood.

[2] This is Aristotle's own illustration (*Eth.* v. 3. 8)—ὄψις : σῶμα : : νοῦς : ψυχή. Whatever may be predicated of the one relation may be predicated

(παράδειγμα) rather than of Analogy. This corresponds to the Socratic παραβολή. But the inference, even though based on a single case, is through a suggested universal. 'Example is when the extreme, or major, term is shown to belong to the middle by means of a term like the third, or minor, term.'[1] Thus in the syllogism—

All wars between neighbours are disastrous ;

The war between Athens and Thebes is between neighbour ;

Therefore it is disastrous—

the major premiss was suggested by an example resembling the war between Athens and Thebes, viz. the war between the Thebans and Phocians, which was disastrous and was a war between neighbours.

§ 1099. Inductive inference, on the other hand, as we saw, proves, according to Aristotle, the major premiss by means of the minor term. Thus—

All wars between neighbours are disastrous,

This, that, and the other war have been (the whole number of) wars between neighbours,

Therefore they have been disastrous.

But the major premiss was proved by examining the several wars comprised in the minor term, and showing that they were disastrous, and also between neighbours.

§ 1100. Aristotle's explanation is not particularly illuminating. He had no grasp of the real principle of Induction. Similarly the Socratic Analogy was too simply enumerative.

Archbishop Whately remarks :—' It has been made a subject of bitter complaint against Logic that it presupposes the most difficult point to be already accomplished, viz. the sense of the terms to be ascertained. A similar objection might be urged against every Art in existence ; e. g. against Agriculture, that all

of the other. Because two sets of terms have certain relations in common (in the case of example certain attributes), they have all in common.

[1] Παράδειγμα δ' ἐστὶν ὅταν τῷ μέσῳ τὸ ἄκρον ὑπάρχον δειχθῇ διὰ τοῦ ὁμοίου τῷ τρίτῳ. . . . φανερὸν οὖν ὅτι τὸ παράδειγμά ἐστιν οὔτε ὡς μέρος πρὸς ὅλον, οὔτε ὡς ὅλον πρὸς μέρος, ἀλλ' ὡς μέρος πρὸς μέρος, ὅταν ἄμφω μὲν ᾖ ὑπὸ ταὐτό, γνώριμον δὲ θάτερον. καὶ διαφέρει τῆς ἐπαγωγῆς ὅτι ἡ μὲν ἐξ ἁπάντων τῶν ἀτόμων (the individual cases) τὸ ἄκρον ἐδείκνυεν ὑπάρχειν τῷ μέσῳ καὶ πρὸς τὸ ἄκρον οὐ συνῆπτε τὸν συλλογισμόν (Induction does not necessarily apply the generalization to a new case), τὸ δὲ καὶ συνάπτει, καὶ οὐκ ἐξ ἁπάντων δείκνυσιν. *An. Pr.* ii. 24, 68ᵇ38.

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the precepts for the cultivation of land presuppose the possession of a farm ; or against Perspective, that its rules are useless to a blind man.'[1]

1101. Example, or Analogy, is used chiefly as a way of meeting objections. Or the argument may controvert an attempted analogy, as that because two things are alike in one respect they cannot be unlike in another, by producing two other things which have the same resemblance but admittedly are unlike in the other respect. Thus the Puritans argued that, as an impression is produced on listeners to a sermon by a general delivery to all at once, so the words of Administration should be repeated once only. Hooker answered : 'The softness of wax may induce a wise man to set his stamp or image therein ; it persuadeth no man that because wool hath the like quality it may therefore receive the like impression.'[2] If MX is Y and MZ is Y it does not follow either that X is not Z or that it is Z. It may be either. Butler did not try to show that the difficulties of revealed truth prove its Divine origin (*credo quia absurdum*), but only that they afford no logical presumption against a Divine origin, seeing that they exist in the natural order also, which the eighteenth-century opponent admitted to be from God's hand. The example adduced is not sufficient to establish a universal affirmative proposition, but it refutes the universal negative. Such a thing has happened once ; therefore it may happen again. And the larger the resemblance between the two cases, considered as systematic wholes, the more probable is it that what is true of the one is true of the other. Or contrariwise, a negative instance refutes a universal affirmative implied in a particular assertion. You choose statesmen by lot, says Aristotle. But who chooses athletes by lot ?[3]

[1] *On Fallacies.*   [2] *Eccl. Pol.* Bk. V. cap. lxviii.
[3] *Rhet.* ii. 20, 1393ª27.

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APPENDIX A

AN ATTACK ON THE INDUCTIVE METHODS

An attack, in what I am obliged to call the writer's style of jocular truculence, is directed in Bradley's Logic against the Inductive Methods, which 'are vicious and their Canons false'. 'Inductive Logic is a superstition,' 'a *fiasco*,' and, since the imperfections attendant on its rules are stated by Inductive logicians themselves, 'a confessed *fiasco*.' The critic promises to show three things—(1) That the Canons suppose universal truths as the material upon which we are to work. (2) That the process they prescribe is not inductive. (3) That they are themselves invalid.

As regards the first point, the raw material of Induction is itself, we are told, a finished product, and presupposes universals inductively obtained. If we expect to be given the material as yet untouched by the Methods we are doomed to disappointment. 'A suspicion of the shock which we are destined to receive may have come from the effrontery of the Method called "Residues". This estimable example of "our great mental operation" comes up to us placarded as one of "the means which mankind possess for exploring the laws of nature by specific observation and experience", and then openly avows that it depends entirely on "previous inductions". Unless supplied beforehand, that is, with one or more ready-made universal propositions, it candidly declines to work at all. We inquire of "Residues" where we are then to begin, and she says, "I do not know; you had better ask 'Difference'." We anxiously turn to consider "Difference" and are staggered at once by the distressing extent of the family likeness. A chilling idea now steals into the mind,' &c.

Well, it is true that this particular Method presupposes the Method of Difference. And it is true that the latter Method may often proceed from inductions already formed to a wider and more general induction. If, instead of asking, Why does this

object (an apple) now fall to the ground, and that object (smoke) now rise towards the sky? I were to ask, Why do apples always tumble and why does smoke always ascend? the materials for the general principle of gravitation would be supplied to the thinker in a half-manufactured state.[1] But what Dr. Bradley is concerned to show is that Inductive method does not ultimately start from sense-material, from bare facts. Surely the ascending property of smoke was generalized by me originally from watching a particular cottage roof or factory chimney; and the law that apples, when anything releases them from their hold of the tree, are sure to fall has been learnt by my picking this one off the ground and by that one falling on my head. Certainly, if ascertained results have once followed from conditions exactly known, I am sure that, given the same conditions, the same results will always follow; and so far the ascertainment of every fact is the perception of a universal. But this is conception rather than induction. The judging faculty, comparing various manifestations of the phenomenon, eliminates the immaterial features of the case and thus abstracts the law of the phenomenon. The eliminated features are not necessarily inductions. They may be, and must ultimately be, individual facts. It was not the prawns made me ill, for I took some last week without ill effects. Nor was it the curry. And so forth. Why should Dr. Bradley choose such an illustration as that 'Oil and alkali, if combined under conditions *bc* and *de*, in each case produce soap'?

It is of little consequence whether I say, 'Curry never disagrees with me,' or 'Curry did not disagree with me last week'. In either case we eliminate an inconsequence. But the employment of a general rule adds security to the induction. The imperfection of the Method of Difference is merely the difficulty of being sure that the requirement of 'every circumstance in common but one' has been fulfilled. This lends some uncertainty to the conclusion. But so does uncertainty attach to the conclusion of a deductive argument by the difficulty of ensuring the exact truth of the premises. Dr. Bradley demurs to the induction from this that and the other dog barking that

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[1] 'It is worth noticing that Aristotle, when he speaks of Induction, is hardly ever thinking of deriving a universal proposition from the observation of particular instances in the proper sense. His examples generally have reference to concepts of species, and what he does is to combine, not particular facts into a lowest concept, but specific concepts into a more general concept, or specific rules into a general rule. That the best driver is the man who understands it is itself a universal rule, but he treats it as particular; in the same way he takes as particulars that man, horse, and mule are without gall, although these are already universal judgements. He does not inquire how these have been obtained from the observation of particular men, horses, and mules' (Sigwart, *Logic*, ii. 292).

all dogs bark, on the ground that we might as well infer, from this that and the other dog having the mange, that all dogs have it. They have 'only one circumstance in common', viz. that they are dogs. Certainly the Method of Agreement can never supply more than a probability.[1] But then life is made up of probabilities; and the difficulty of distinguishing the materials of one induction from those of another demands not better logic but better observation. The Canons, says Dr. Bradley, are not hard to content. Neither is the Syllogism, which takes what it can get. Why does not Dr. Bradley object to the syllogism that it deduces from the results of previous deductions (until an ultimate intuited principle is reached), and uses already made materials? Every syllogism has for prosyllogism another syllogism.

The second criticism is that the process of the Methods is not really inductive. 'It is not of the essence of their process to bring out a conclusion more general than the premisses. The process is one of elimination. By removing one part of an ideal construction you establish the remainder. And hence the result will be more abstract than the whole original *datum*, but it need not be more abstract than some of the premisses. On the contrary it may be less so.'[2] To be sure, if I want to know why the dogs in the yard are barking, and conclude after consideration that it is because they are chained up, I have eliminated the circumstances that they are four-footed, or that Ponto is handsome and Neptune worth more than ten pounds, all of which portions of the ideal construction are wider than the fact that they are at this moment chained. But all we are concerned with is that 'chained' is less particular than 'the dogs in the yard barking'. Conversely, the conclusion of a syllogism is often wider and more abstract than the minor premiss. 'A ribston is subject to the law of gravitation' (conclusion) is more general than 'A ribston is an apple' (minor premiss). But it does not follow that in a deductive reasoning we are not descending from the less to the more concrete.

The third objection to the Methods is that they are in themselves 'radically vicious'. Though 'recommended to us as a sort of Gospel' they are transparently 'false statements'. If Dr. Bradley can show this of the Method of Difference, no doubt he can do the business of the rest. What does he say of it? 'The foundation of the Method, "that whatever cannot be eliminated is connected with the phenomenon by a law," is quite false, unless we add to it "*in this one case*", and thereby make

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[1] If the many dogs I had ever observed had had the mange, I should be justified in inferring the high probability that every dog is liable to it, and that Diana's new puppy will have it some time

[2] *Logic*, p. 337.

it ineffectual for the purpose of generalizing. . . . In the premisses *ABC—def*, *BC—ef*, you are supposed to know that *def* is connected with *ABC*, and *ef* with *BC*; what you do *not* yet know is if, in *ABC*, *A* is really a factor. For it might be irrelevant, and *BC* without it might produce *def*. But now, having *BC—ef*, and resting on the assumption which we call the Principle of Identity, you are sure that, if *BC—ef* is once true, it will be true for ever. And you proceed from this to argue that *BC—def* must be false. For to produce *def B* must have been altered; and since in *ABC—def* the result is produced with no possible alteration except mere *A*, *A* there must be relevant to the presence of *def*. Hence *A in this case* (of *ABC—def*) must be, directly or indirectly, relevant to *d*. But you must not go further. . . . And we must not forget that even this conclusion depends on our having assumed in the premisses that, in *ABC* —*def*, *d* is not irrelevant. Unless we are perfectly sure before-hand that the whole *def* has been produced by *ABC*, we cannot advance one single step.'[1]

I am, however, quite unable to discern the difference between *A* being 'relevant to' *d* and being 'an indispensable part of the cause' of *d*. And if it is so *in this case* it must be so, as Dr. Bradley himself says just before, in every case. What subtler meaning lies in his contention is not easy to discover. The threefold exposure of the famous Methods is hardly so convincing as to justify the scornful violence of the language directed against them. But in the critic's opinion the Methods 'must retire from the field, or withdraw their claims. Something like a farce has been played before us, whether we consider the airs and pretences of the Canons, or remember the promises and boasts of their patron.'[2] Really one would suppose that the late John Stuart Mill was the proud pontiff of some logical Established Church.

APPENDIX B

ANALYTICAL DEDUCTION

Bradley's objection to Mill's exposition of the Methods that they do not start from facts but from inductions already formed, might just as well be alleged against the inductive explanation of a phenomenon; for the general law, which has been inductively reached, when *applied* to the phenomenon in question is

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[1] Op. cit. pp. 339, 341.   [2] Ibid. p. 336.

applied to it *deductively*, and yet the result is usually a generalization and not a bare fact. Thus, the President of Corpus, criticizing Whewell, Jevons and others, urges that the following is not an induction but an 'analytical deduction'—

Such and such *spectra* are effects of various gases.
Solar *spectra* are such *spectra*.
Therefore solar *spectra* are effects of those gases.

'In the same way,' he adds, 'to infer a machine from hearing the regular tick of a clock, to infer a player from finding a pack of cards arranged in suits, to infer a human origin of stone implements, and all such inferences from patent effects to latent causes, are really deductions which, besides the minor premiss stating the particular effects, require a major premiss inducing the particular kind of effects of a particular kind of cause. . . . A deduction is often like an induction in inferring from particulars; the difference is that deduction combines a law in the major with the particulars in the minor premiss, and infers syllogistically that the particulars of the minor have the predicate of the major premiss; whereas induction uses the particulars simply as instances to generalize a law. An infallible sign of an induction is that the subject and predicate of the universal conclusion are merely those of the particular instances generalized; e. g. These magnets attract iron; therefore all do.'[1]

But the 'analytical deduction' is merely the inductive generalization applied to the phenomenon under investigation. We are investigating the cause of the solar *spectra*. Examining similar *spectra* which are more within our reach we find that they are the effects of various gases. A causal connexion is established, and we say, 'Such and such kinds of *spectra* are effects of various gases.' This is the general law of which we were in search. But the induction is not finished till we say, deductively: 'Therefore solar *spectra*, being of that kind, are the effects of those gases.' And, as such a discovery is itself a generalization, it is often called the result of the induction, or even the induction itself, though, strictly speaking, it is a deductive application of the induced general principle.

In the other instances given by Dr. Case the phenomenon investigated is not a uniformity but a single fact. What is the explanation of the ticking which I hear, of this pack being arranged in suits, of these flints being fashioned as implements? Induction leads us to general principles — ticking implies machinery; regular arrangement of cards proves a player; artificial shapes of stones indicate human workmanship. But we should more naturally say, 'The explanation of this pack being found in suits is that it has been played with'; and so forth. Similarly, the explanation of an apple falling may be said to be either that it, being ponderable, is attracted by the

[1] *Encycl. Brit.*, 10th ed., art. 'Logic.'

earth, or that all ponderable things are attracted by the earth, or, more generally still, the universal law of gravitation. It should be observed, however, that though we are here investigating an individual fact, the explanation, 'This apple, being ponderable, suffers the earth's attraction,' is really a generalization and not a mere fact. And the same with the cards or the flints, if we say that, being incapable of sorting or shaping themselves, their condition is a sign of intelligent agency. The statement of a cause is the statement of a law, even though it be exhibited not abstractedly but as embodied in a phenomenon. In induction we infer from particulars to particular, through a detected law. But as the particulars from which we started were themselves, as Bradley complains, ready-made uniformities, so the particular to which we infer has a general character also. We knew beforehand that terrestrial *spectra* had for antecedents certain gases, and by the inductive canons we proved a fact of causation. And now we deduce the same causal connexion in the case of similar solar *spectra*. Only, until we used the canons, the causal connexion between the gases and the terrestrial *spectra* was not proved. The original materials of the induction were mere empirical uniformities. Whereas in the case of the solar *spectra* the causal *nexus* is proved—proved by the induction. The process of proving it of the terrestrial *spectra was* the induction, not something prior to the induction. The proof that a law exists is a generalization. It is true that the law that terrestrial *spectra* are due to certain gases does not seem as abstract and general as the law that *spectra* of that kind are due to gases of that kind, for it might be that 'terrestrial' would make a difference. But in that case we could not have argued to solar *spectra*, and the required induction or explanation is not accomplished. We must assume that the examination of the phenomena within our reach has proved a general and not merely terrestrial connexion of cause and effect between gas and *spectrum*.

Frequently we do not wait to demonstrate our general law, but make a probable guess at it, assume it true, and then, applying it deductively, verify the conclusion. The President of Corpus, however, says :—

' Jevons, Sigwart, and Wundt all think that induction contains a belief in causation, in a cause or ground which is not present in the particular facts of experience, but is contributed by a hypothesis added as a major premiss to the particulars in order to explain them by the cause or ground. Not so. When an induction is causal the particular instances are already beliefs in particular causes, e. g. *A B C* magnets attract iron, and the problem is to generalize these causes, not to introduce them. Induction is not introduction. . . . We first experience that particular causes have particular effects ; then induce that causes similar to those have effects similar to these ; finally induce that when a particular cause

of the kind occurs it has a particular effect of the kind by synthetic deduction, and that when a particular effect of the kind occurs it has a particular cause of the kind by analytic deduction with a convertible premiss; as when Newton, from planetary motions like terrestrial motions, analytically deduced a centripetal force to the sun like centripetal forces to the earth. . . . In all induction the universal is the conclusion, in none a major premiss, and in none the ground of either the being or the knowing of the particulars. Induction is simply generalization.'

He adds that induction 'is not syllogism in the form of Mill's syllogism from a belief in the uniformity of nature'. 'The fact is that the uniformity of nature stands to induction as the axioms of syllogism do to syllogism; they are not premisses but conditions of inference, which ordinary men use spontaneously. . . . Induction is no species of deduction; they are opposite processes.'

About this I have said what I have to say in the text, under Induction.

APPENDIX C

HYPOTHETICAL CHARACTER OF UNIVERSALS

In the article already quoted from the new edition of the *Encyclopaedia Britannica*, the distinguished writer criticizes Sigwart's 'false reduction of categorical universals to hypotheticals', which would explicate *Barbara*—'All men are mortal; all professors are men; therefore all professors are mortal'—in this way—

> If anything is a man it is mortal;
> If anything is a professor it is a man;
> Therefore if anything is a professor it is mortal.

The President says:—'This unnatural form, certainly not an analysis of any conscious process of categorical reasoning, breaks down at once, because it cannot explain those moods in the Third Figure, e. g. *Darapti*, which reason from universal premisses to a particular conclusion.

> If anything is a professor it is good;
> If anything is a professor it is wise;
> Therefore something wise is good.'

This, Dr. Case observes, is a *non-sequitur* and admittedly illogical. I presume he means that we have no right to conclude that wisdom and goodness are sometimes combined, since

from the form of the premisses professors may, for all we know, be non-existent. But this is merely the familiar objection to 'All *A*'s are *B* ' being converted as ' Some *B*'s are *A* ', seeing that 'All perfect things are as God designed them' need not imply that anything is perfect, nor 'All who make more than 100 marks will deserve a prize' imply that any will make more. *Darapti* merely says that, granted the occurrence of the subject, the predicated qualities then and there will be found in conjunction. They are, on the hypothesis, not incompatible. The conclusion of the above syllogism should have been, 'If anything is wise it may be good.'

Sigwart's view, however, destroys, we are told, the fabric of inference, and reduces scientific laws to mere hypotheses.

'The greatest absurdity is that if all universals were hypothetical, *Barbara* would become a purely hypothetical syllogism—a consequence which seems innocent enough till we remember that all universal affirmative conclusions in all sciences would with their premisses dissolve into mere hypothesis. No logic can be sound which leads to the following conclusion—

' If anything is a body it is extended ;

If anything is a planet it is a body ;

Therefore if anything is a planet it is extended.

" Every *M* whatever is a *P* " is a universal which we believe on account of previous evidence without any condition about the thing signified by the subject *M*, which we simply believe sometimes to be existent (e. g. Every man existent) and sometimes not (e. g. Every centaur conceivable). . . .

' By "all" we mean every individual whatever of a kind ; and when from the experience of sense and memory we start with particular judgements of existence, and infer universal judgements of existence and scientific laws, we further mean those existing individuals which we have experienced, and every individual whatever of the kind which exists. We mean neither a definite number of individuals, nor yet an infinite number, but an incalculable number, whether experienced or inferred to exist. We do not mean existing here and now, nor yet out of time and place, but at any time and place (*semper et ubique*)—past, present, and future, being treated as simply existing, by what logicians used to call *suppositio naturalis*. We mean then by "all existing" every similar individual whatever, wherever, whenever existing.

' Hence Sigwart is right in saying that "All bodies are extended " means, "Whatever is a body is extended," but wrong in identifying this form with "If anything is a body it is extended ". "Whatever" is not "If anything". For the same reason it is erroneous to confuse "all existing " with a general idea. Nor does the use of abstract ideas and terms make any difference. When Bosanquet says that in "Heat is a mode of motion " there is no reference to individual objects but a pure hypothetical form which absolutely neglects the existence of objects, he falls far short of expressing the nature of the scientific judgement ; for in his *Theory of Heat* Clerk Maxwell describes it as "believing heat as it exists in a hot body to be in the form of kinetic energy ".'

The doctrine which is here ascribed to Sigwart has appeared in some form or other in every logical treatise, and is common,

in fact, to the whole human race. No one who ever lived has at all times used ' all ' to mean merely a finite but incalculable number. If we say 'All selfish persons are unhappy', or 'All running waters tend to find their own level', we mean more than the entire number of actual instances, past, present, and future. We give to ' all ' an abstract and ideal signification, judging not only that every selfish person has been, is, or will be, *as a contingent fact*, unhappy, but that there is a causal connexion ; and *if*, besides the actual individuals seen or foreseen by the eye of Omniscience, any other case of selfishness could be *supposed*, it too would necessarily be attended by unhappiness. So also we judge that it is the *nature* of running water to seek its own level.

So far as science is the enunciation of general laws its categorical universals are necessarily hypothetical.

But 'hypothetical' need not imply a doubt as to the existence of a real class of things about which the law is affirmed. It merely implies that if anything is found to have the specified attributes it has also the predicated attributes. ' A fast horse is valuable' means 'if any horse is fast it is valuable '. In this sense *quicquid* and *siquid* mean the same thing. Compare 'Whatsoever things (ὅσα) are pure ; if there be any (εἴ τις) virtue and if there be any praise '.

The ' all ', however, of which Professor Case is thinking does, no doubt, assert by implication the existence of the subject, and not leave it an open question. If the properties of heat are described, the description is assumed to be of an existing thing. 'All bodies are extended ' does convey to the hearer the idea that bodies exist. Equally 'All three-headed giants breakfast on babies ' is meant to convey the idea that three-headed giants exist. The difficulty, however, is a simple one. No one really says that all universals are hypothetical—except so far as this may be philosophically maintained of all subjects whatever. We have to distinguish—as has been done above in the text, § 536— between abstract universals and concrete universals. ' All ' may be general and hypothetical, or it may be definite and assumptive. In the latter case it stands for ' All the '. ' All bodies are extended ' is in a sense abstract. If anything comes under the designation ' body' it has the quality of extension. But it is also a judgement of assumption, meaning 'All the class of bodies ', referring to a definite and familiar thing. The ambiguity is rather more noticeable in the use of ' Every '. In French, again, there is not the same distinction as in English between ' All ' and ' All the ', and Latin is more ambiguous, for want of a definite article, than Greek.

APPENDIX D

INDIFFERENCE OF QUANTITY OF THE MINOR

In order to exhibit the indifference of the quantity of the minor term, and to simplify mood and figure as much as possible, it may be worth while to suggest—

(1) That the quantity of the minor when affirmative, whether universal or particular, should be symbolized by the letter U, and when negative by the letter Y. U will thus stand for A or I indifferently, and Y for E or O, minor and conclusion corresponding quantitatively.

(2) That l and r be retained as the only non-significant consonants, for the sake of euphony, after major and minor premiss respectively.

(3) That the Second Figure be marked by the initial consonant B, the Third by C, the Fourth by D.

(4) That Figures I and II be regarded as the double norm of all syllogism, the former standing for the affirmation of the antecedent, the latter for the denial of the consequent. It is to be understood that direct moods of the Third Figure (C moods) reduce to the form of the First, and moods of the Fourth Figure (D moods) reduce to that of the Second; in either case by merely converting the minor premiss, no other reduction being required. The conclusion, however, of moods in Figures III and IV is not indifferent.

(5) That indirect moods, which, as they stand, give a conclusion about P, and only about S by conversion of the conclusion, that is, which require the premisses to be transposed in order to give a direct conclusion about S, be put on one side. These are, *Disamis* and *Bocardo* in Figure III, and *Bramantip* and *Dimaris* in Figure IV.

We shall then get eight regular forms :—

Figure I.

$$Aluru = \begin{cases} \textit{Barbara} \text{ or} \\ \textit{Darii}. \end{cases}$$

$$Elury = \begin{cases} \textit{Celarent} \text{ or} \\ \textit{Ferio}. \end{cases}$$

Figure II.

$$Balyry = \begin{cases} \textit{Camestres} \text{ or} \\ \textit{Baroco}. \end{cases}$$

$$Belury = \begin{cases} \textit{Cesare} \text{ or} \\ \textit{Festino}. \end{cases}$$

Figure III.

$$Caluri = \begin{cases} Darapti \text{ or} \\ Datisi. \end{cases}$$

$$Celuro = \begin{cases} Felapton \text{ or} \\ Ferison. \end{cases}$$

Figure IV.

$$Dalere = \quad Camenes.$$

$$Deluro = \begin{cases} Fesapo \text{ or} \\ Fresison. \end{cases}$$

It will be observed that the conclusion in Figure III is *I* or *O*, and in Figure IV is *E* or *O*, the quantity here of the minor being indifferent but the conclusion always particular, except *Dalere* (*Camenes*), which concludes in *E* as its minor is always *E*.

Looking at the reserved moods, the ones with transposed premisses, it will be observed that in all of them the real major (the seeming minor) premiss is the same, viz. Every *M* is *S*. It is the quantity of the seeming major (but real minor) premisses which is indifferent. *Disamis* (*Cirali*) will then, converting its real minor premiss, group with *Bramantip* and *Dimaris* (*Durali*), while *Bocardo* (*Coralo*) stands by itself, though it might be placed under *Felapton*, if that mood were regarded as having transposed premisses :—

Felapton.	*Bocardo.*
No *M* is *P* = Some not-*P*'s (at least) are *M*.	Some *M*'s are not *P* = Some not-*P*'s are *M*.
Every *M* is *S*.	Every *M* is *S*.

Therefore Some not-*P*'s are *S*.
That is, Some *S*'s are not *P*.

Camenes, if regarded as having transposed premisses, wants (the pair being represented by *Durely*) a subaltern *Cimenos*, which, however, is an invalid mood.

The above scheme, placing syllogistic forms on the simplest basis, has the disadvantage of appealing better to the eye than to the ear. On the other hand, while it gets rid of all marks of reduction, it shows at once, by the initial letters, what figure a mood is in, whereas in the ordinary *Barbara Celarent* scheme this is only known *memoriter.*

APPENDIX E·

REDUCTION PER IMPOSSIBILE

All moods may be proved indirectly by a reduction *per impossibile,* i. e. *per deductionem ad impossibile.*

I. First, *retaining the major premiss.* It must for direct moods concluding in *A* or *E* be retained as major premiss; otherwise the substituted premiss, which will be particular, must stand in that place.

The contradictory of the inference supposed to be denied standing as minor premiss, the new conclusion contradicts the old minor, which is the omitted, premiss.

Figure I.	Figure II.

Barbara.　　　　　*Baroco.*
Every *Y* is *Z*　　Every *Y* is *Z*
Every *X* is *Y*＼　Some *X*'s are not *Z*
Every *X* is *Z*　＼Some *X*'s are not *Y.*

Darii.　　　　　*Camestres.*
Every *Y* is *Z*　　Every *Y* is *Z*
Some *X*'s are *Y*＼　No *X* is *Z*
Some *X*'s are *Z*　＼No *X* is *Y.*

Celarent.　　　　*Festino.*
No *Y* is *Z*　　No *Y* is *Z*
Every *X* is *Y*＼　Some *X*'s are *Z*
No *X* is *Z*　＼Some *X*'s are not *Y.*

Ferio.　　　　　*Cesare.*
No Y is *Z*　　No *Y* is *X*
Some *X*'s are *Y*＼　Every *X* is *Z*
Some *X*'s are not *Z*　＼No *X* is *Y.*

Reverse the two columns for the proof of the moods of Figure II by those of Figure I.

Figure III.	Figure II.

Darapti.　　　　*Camestres.*
Every *Y* is *Z*　　Every *Y* is *Z*
Every *Y* is *X*＼　No *X* is *Z*
Some *X*'s are *Z*　＼No *X* is *Y.*

No *X* is *Y,* converted to No *Y* is *X,* is the *contrary* (which includes the contradictory) of Every *Y* is *X* ; but it is the con-

tradictory of the converse of Every *Y* is *X*, viz. Some *X*'s are *Y*.
Similar conversion is required in the three following cases—

Datisi.	*Camestres.*
Every *Y* is *Z*	Every *Y* is *Z*
Some *Y*'s are *X*\	No *X* is *Z*
Some *X*'s are *Z* \No *X* is *Y*.	

Felapton.	*Cesare.*
No *Y* is *Z*	No *Y* is *Z*
Every *Y* is *X*\	Every *X* is *Z*
Some *X*'s are not *Z* \No *X* is *Y*.	

Ferison.	*Cesare.*
No *Y* is *Z*	No *Y* is *Z*
Some *Y*'s are *X*\	Every *X* is *Z*
Some *X*'s are not *Z* \No *X* is *Y*.	

The indirect moods *Disamis* and *Bocardo* have transposed
premisses, and therefore the old major must stand as the new
minor—

Disamis.	*Festino.*
Some *Y*'s are *Z*	No *X* is *Z*.
Every *Y* is *X*\	Some *Y*'s are *Z*
Some *X*'s are *Z* \Some *Y*'s are not *X*.	

Bocardo.	*Baroco.*
Some *Y*'s are not *Z*	Every *X* is *Z*
Every *Y* is *X*\	Some *Y*'s are not *Z*
Some *X*'s are not *Z* \Some *Y*'s are not *X*.	

It will be seen that the moods of Figure II can be proved by
those of Figure III, but not so directly as by those of Figure I.
The conclusions of *Camestres* and of *Cesare* must be simply con-
verted, and then proved by *Datisi* and *Ferison* respectively.
Festino and *Baroco* do not require any conversion of the conclu-
sion; but it is the old minor premiss in their case which must
be retained in the major place.

Figure IV.	Figure I.
Fesapo.	*Celarent.*
No *Z* is *Y*	No *Z* is *Y*
Every *Y* is *X*\	Every *X* is *Z*
Some *X*'s are not *Z* \No *X* is *Y*.	

Fresison.	*Celarent.*
No *Z* is *Y*	No *Z* is *Y*
Some *Y*'s are *X*\	Every *X* is *Z*
Some *X*'s are not *Z* \No *X* is *Y*.	

Here, again, the new conclusion is the contradictory of the

old minor converted. If the new conclusion be itself converted simply, it is the contrary of the minor of *Fesapo*. *Celarent* may be proved reversely by *Fresison*.

The indirect moods of Figure IV require the old major to be retained as minor premiss—

<div align="center">

Figure IV.   Figure III.

Bramantip.   *Fesapo.*   *Felapton.*
Every Z is Y No X's are Z = No Z's are X
Every Y is X Every Z is Y
Some X's are Z Some Y's are not X.

Dimaris.   *Fresison.*   *Ferison.*
Some Z's are Y No X's are Z = No Z's are X
Every Y is X Some Z's are Y
Some X's are Z Some Y's are not X.

Camenes.   *Dimaris.*   *Disamis.*
Every Z is Y Some X's are Z = Some Z's are X
No Y is X Every X is Y
No X is Z Some Y's are X.

</div>

II. Next let us try retaining the Minor premiss :—

<div align="center">

Figure I.   Figure III.
Barbara.   *Bocardo.*
Every Y is Z Some X's are not Z
Every X is Y Every X is Y
Every X is Z Some Y's are not Z.

Darii.   *Ferison.*
Every Y is Z No X's are Z
Some X's are Y Some X's are Y
Some X's are Z Some Y's are not Z.

Celarent.   *Disamis.*
No Y is Z Some X's are Z
Every X is Y Every X is Y
No X is Z Some Y's are Z.

Ferio.   *Datisi.*
No Y is Z Every X is Z
Some X's are Y Some X's are Y
Some X's are not Z Some Y's are Z.

Figure II.   Figure III.

Cesare.   *Disamis.*
No Z is Y Some X's are Z
Every X is Y Every X is Y
No X is Z Some Y's are Z
                         = Some Z's are Y.

</div>

Festino.   *Datisi.*
No Z is Y Every X is Z
Some X's are Y Some X's are Y
Some X's are not Z Some Y's are Z
                $=$ Some Z's are Y.

     Camestres.   *Ferison.*
Every Z is Y Some X's are Z } invert order.
No X is Y No X is Y
No X is Z Some Z is not Y.

Here the retained minor premiss must be made the new major.
But *Camestres* may, by privative conception, be regarded as a
direct mood. It will then be proved by *Disamis*—Some X's
are Z, Every X is non-Y, therefore Some non-Y is $Z =$ Some
Z is not Y.

Similarly—
       Baroco.   *Datisi.*
    Every Z is Y Every X is Z
Some X's are not Y Some X's are not Y
Some X's are not Z Some not-Y's are $Z =$ Some
                Z's are not Y.

But, transposing premisses, *Baroco* may be proved by *Bocardo.*

      Figure III.   Figure I.
      Darapti.   *Celarent.*
   Every Y is Z No X's are Z
   Every Y is X Every Y is X
Some X's are Z No Y is Z.
(Contraries, not contradictories.)

     Datisi.   *Ferio.*
   Every Y is Z No X's are Z
Some Y's are X Some Y's are X
Some X's are Z Some Y's are not Z.

    Dimaris.   *Celarent.*
Some Y's are Z No X's are Z
   Every Y is X Every Y is X
Some X's are Z No Y's are Z.

     Felapton.   *Barbara.*
    No Y is Z Every X is Z
   Every Y is X Every Y is X
Some X's are not Z Every Y is Z.
(Contraries again.)

     Ferison.   *Darii.*
    No Y is Z Every X is Z
  Some Y's are X Some Y's are X
Some X's are not Z Some Y's are Z.

Bocardo.	*Barbara.*
Some Y's are not Z	Every X is Z
Every Y is X	Every Y is X
Some X's are not Z	Every Y is Z.

Figure IV.	Figure I.
Bramantip.	*Celarent.*
Every Z is Y	No X is Z
Every Y is X	Every Y is X
Some X's are Z	No Y is Z.

Dimaris.	*Celarent.*
Some Z's are Y	No X is Z
Every Y is X	Every Y is X
Some X's are Z	No Y is Z.

In these two the new conclusion contradicts the converted premiss.

Camenes.	*Ferio.*	
Every Z is Y	Some X's are Z	} transpose and convert.
No Y is X	No Y is X	
No X is Z	Some Z's are not Y.	

Fesapo.	*Barbara.*
No Z is Y	Every X is Z
Every Y is X	Every Y is X
Some X's are not Z	Every Y is Z.

Fresison.	*Darii.*
No Z is Y	Every X is Z
Some Y's are X	Some Y's are X
Some X's are not Z	Some Y's are Z.

I submit the above rather as a school exercise than for any other purpose. Proof of the third and fourth Figures by reduction *per impossibile* through the first or second is not an entire waste of time, since the principle of ratiocination is seen most clearly in Figures I and II. But what could be more anomalous than to show that, if a person declines to be bound by reasoning in *Barbara* or *Cesare*, he will incur the terrors of *Bocardo* or of *Disamis*? Having committed the greater defiance he is not likely to blench at the lesser. Demonstrative proof of syllogism in itself by *reductio ad absurdum* is *probare in circulo*, seeing that the proof assumes the truth of syllogistic reasoning. The principle of rational illation is ultimate and undemonstrable. No doubt in practice this kind of reduction is often useful, by showing an opponent that rejection of your reasoning, because he does not see his way through it, leads to a conclusion which he has already admitted to be false. And the logical use of *reductio ad absurdum* or *ad impossibile*, is, when the principle of a certain Figure has been granted, to show thereby the truth of a conclusion in some other Figure.

APPENDIX F

RESTRICTIVE FORM OF MAJOR PREMISS

Although it may seem far-fetched to express 'Every X is Y' in the form 'No non-Y is X', and still more far-fetched to state 'No X is Y' in the form 'No not-not-Y is X', yet in common speech such equivalents are quite usual. We can equally well say, ' Everything which happens is in accordance with God's providence,' or, 'Nothing which is not (nothing but what is) in accordance with God's providence happens' ; as well, 'Nothing came about which was expected,' or, ' Nothing which was not unexpected came about.' Again, ' No not-Y is X' can be phrased thus—Nothing but Y is X, or, Only Y is X. And ' No not-not-Y is X', thus—Nothing but what is not Y is X, or, Only not-Y is X.

With major premisses expressed thus in restrictive form, the syllogistic Moods exhibit their principle in a new light. Thus—

Figure I.

Barbara (Darii).
Only what is P is M (or, Only P's are M).
But, All (Some) S's are M.
Therefore All (Some) S's are P.

Celarent (Ferio).
Only what is not P is M.
But, All (Some) S's are M.
Therefore All (Some) S's are not P.

Figure II.

Cesare (Festino).
Only what is not M is P.
But, All (Some) S's are M.
Therefore No S is P (Some S's are not P).

Camestres (Baroco).
Only what is M is P.
But, No S is M (Some S's are not M).
Therefore No S is P (Some S's are not P).

Figure III.

Darapti (Datisi).
Only what is P is M.
But, All (Some) things which are M are S.
Therefore Some things (at least) which are S are P.

Felapton (Ferison), the same, substituting not-P for P.

Disamis.

> Some things that are M are P (Some things are at once M and P).
>
> But, Only what is S is M.
>
> Therefore Some things that are S are P (are at once S and P).

Bocardo, the same, substituting not-P for P.

Figure IV.

Bramantip (Dimaris).

> All (Some) P's are M.
>
> But, Only what is S is M.
>
> Therefore, Some things that are S are P.
>
>   (Some things are at once P and S.)

Camenes.   *aliter.*

Only what is M is P.	All P's are M.
But, Nothing which is M is S.	But, Only what is not S is M.
Therefore, No S is P.	Therefore, No P is S, and No S is P.

Fesapo (Fresison).

> Only what is not M is P.
>
> But, All (Some) things which are M are S.
>
> It follows that Some things which are S are not P.

'Only Y' (equivalent, as we have seen, to No not-Y) is restrictive of the sphere or extension of X by limiting it to Y, but cannot restrict X's connotation. Thus, 'Bullies are always cowards' is as much as to say, Only cowards are bullies. But for 'Cowardice is always an attribute of bullies' we cannot substitute, 'Only cowardice is an attribute of bullies.' Similarly 'None but Y' expresses an extension, a limited class.

On the other hand, 'Every X is Y' might be thus expressed —Only Y-ness enables X to exist, to be what it is. Only the bereaved can sympathize (All who sympathize are of those who have been bereaved). That is, Only bereavement causes a sympathizer to be a sympathizer, brings sympathy into being. All really noble persons are good. Only to be good is noble. 'Tis only noble to be good. That is, Only goodness makes us call a man noble.

It will be seen that by throwing propositions into this restrictive form, any Figure can be brought under any other. Mr. Stock suggests the name, 'Converse Use of Reduction by Negation.' Thus—

Barbara	becomes	*Cesare.*
Every M is P		No not-P is M
Every S is M		Every S is M
$\therefore$ Every S is P		$\therefore$ No S is not-P = Every S is P.

APPENDIX G

SYLLOGISMS IN COMPREHENSION

The opinion has been expressed in the text that the importance ascribed by Sir William Hamilton to the distinction between Syllogisms expressed in Extension and Syllogisms expressed in Intension is exaggerated. Possession of a quality and inclusion in a class of things which possess a quality are inseparable ideas. In any case, Hamilton fails to observe that, understood intensively, ὑπάρχειν ἐν or εἶναι ἐν cannot mean 'is part of a subject idea', but rather, 'is among the attributes possessed by a subject.'

Nevertheless, reasoning may be expressed by attributes in some such form as this—*P*'ness always accompanies *M*'ness, and *M*'ness accompanies *S*'ness; therefore *P*'ness accompanies *S*'ness. 'Co-exists with' is, we have seen, a little ambiguous, since it may seem to imply that wherever the predicate quality is found the subject quality will be found also; which is more than is intended. Similarly the phrase, '*P*'ness is a mark of *S*'ness,' is open to the objection attending the *ratio cognoscendi*, that it may be taken to imply that wherever *P* is found we may be sure of finding *S*. Using, then, 'goes with' or 'accompanies' we may state the Syllogistic Moods thus :—

Figure I.

Barbara. *P*'ness always goes with *M*'ness (major premiss) and *M*'ness with *S*'ness (minor); therefore *P*'ness always goes with *S*'ness.

Darii. 'Sometimes' must be inserted in minor premiss and conclusion.

Celarent. *P*'ness never goes with *M*'ness, but *M*'ness always goes with *S*'ness; therefore *P*'ness never goes with *S*'ness.

Ferio. 'Sometimes' in minor premiss for 'always', and 'not always' for 'never' in conclusion.

Figure II.

Cesare. *M*'ness never goes with *P*'ness but always with *S*'ness; therefore *P*'ness and *S*'ness are never associated.

Festino. *M*'ness never goes with *P*'ness, but sometimes with *S*'ness. *P*'ness therefore is not always found where *S* is found.

Camestres. M'ness always goes with P'ness but never with S'ness; therefore P'ness and S'ness are never found together.

Baroco. M'ness always goes with P'ness, but not always with S'ness. P'ness, then, does not always accompany the presence of S'ness.

Figure III.

Darapti. M'ness is always accompanied by both P'ness and S'ness. P'ness and S'ness, then, are sometimes (at least) found united in a subject.

Datisi. M'ness is always accompanied by P'ness and sometimes by S-ness; P'ness and S'ness, then, sometimes go together.

Disamis. The same, with P and S interchanged.

Felapton. M'ness is never accompanied by P'ness but always by S'ness. S'ness, we infer, is sometimes (at least) found without P'ness.

Ferison. 'Sometimes' for 'always' in minor premiss.

Bocardo. 'Not always' for 'never' in major premiss.

Figure IV.

Bramantip. P'ness is always accompanied by M'ness, and M'ness always by S'ness. It follows that S'ness is sometimes accompanied by P'ness.

Dimaris. 'Sometimes' for 'always' in major premiss.

Camenes. 'Never' for 'always' in minor premiss, and for 'sometimes' in conclusion.

Fesapo. P'ness is never accompanied by M'ness and M'ness is always accompanied by S'ness. Accordingly S'ness is not always accompanied by P'ness.

*Fresison.* 'Sometimes' for 'always' in minor premiss.

The diagrams by which Inference is ordinarily exhibited in logical treatises to the eye are based on class-inclusion, that is, on extension. Is a reverse order of inclusion, based on comprehension, possible? The import of the proposition, as we have seen, is not that the predicate notion is included in, or part of, the subject notion, but rather that the predicated quality is included among the attributes of the subject thing. Thus, 'William's aunt is a laundress; laundresses earn money; earners of money are bipeds,' cannot mean that the notion of two-footedness is part of the notion of earning money; that earning money is part of the notion of washing clothes; and that washing clothes is one of the ideas into which the conception

of being an aunt of William's may be analysed. The possible
notations, then, are these two—
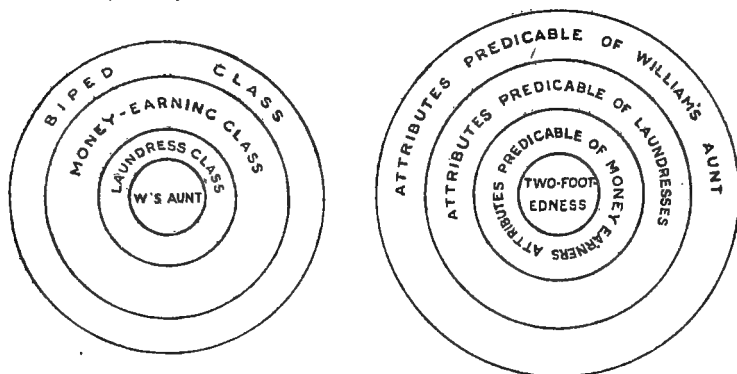
whereby we see at a glance that William's aunt is a biped, and
that being a biped is an attribute predicable of William's aunt.

It is, however, impossible to represent a *negative* Intensive
Syllogism by inclusive and exclusive lines. Thus—William's
aunt is a laundress; no laundress is a duchess; then William's
aunt is not a duchess. Intensively—the attributes of William's
aunt include that of being a laundress, and being a laundress
excludes the attribute of being a duchess. But the argument
cannot be represented thus—
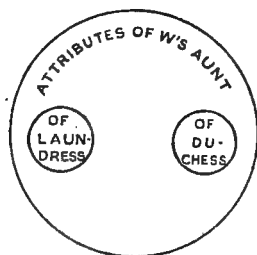
On the other hand, while 'Every S is M, no M is P; there-
fore no S is P' cannot be shown intensively by circles (S attri-
butes include M, M attributes exclude P; therefore S attributes
exclude P), we can depict, 'S attributes exclude M, M attributes
include P; therefore S attributes exclude P,' by circles thus—

But this, though it looks correct on paper, is false reasoning—No *S* is *M*; Every *M* is *P*; therefore no *S* is *P*. It is clear, then, that qualitative relations cannot be represented in this manner.

A quality or abstraction identified with another quality or abstraction is not predicated of it. 'Time is money.' 'To labour is to pray.' 'Punctuality is the politeness of princes.' 'Imitation is flattery.' 'A kind of' we must often add in thought, for subject and predicate are not always convertible ; but this does not make the predicate a common noun and so potentially adjectival. We cannot say, 'Time is a money.' What is predicated is 'identical with'.

APPENDIX H

SOME SYLLOGISTIC VARIATIONS

Representing 'Every *X* is *Y*' by 'No non-*Y* is *X*', the recasting of syllogistic moods will appear to give us in some cases two negative premisses and in some a *quaternio terminorum*, or even five or six terms. Thus, *Barbara* takes the form—No non-*P* is *M*, and No non-*M* is *S*; therefore, No non-*P* is *S*. *Celarent* will be, No *P* is *M*, No non-*M* is *S*; therefore, No *P* is *S*. *Cesare* will be expressed thus—No *M* is *P*, and No non-M is *S*; therefore No non-*P* is *S*. *Darapti* thus—No non-*P* is *M*, and Every non-*S* is non-*M*; therefore, Some *S* is *P*.

Roundabout as these forms may seem, arguments are often so expressed. If we wish to show that there is no reason why the wholesome and the entertaining should not be found together, we may equally well premise, 'This entire book is at once wholesome and entertaining,' or, 'There is nothing but what is entertaining in this book, and for unwholesomeness you must look elsewhere' (*Darapti*).

The illative principle in such cases of (seeming) double negation is not perhaps so obvious as in the syllogism as ordinarily expressed. But, if we take *Barbara*, 'No non-*P* is *M*, No non-*M* is *S*' clearly means that anything which is not *P* is not *M*, and anything which is not *M* is not *S*; therefore if anything is not *P* it cannot be *S*. That is, Everything which is *S* is *P*. Similarly *Darapti*—No non-*P* is *M*, and no non-*S* is *M*. In other words, if anything is *M* it must be something which is not not-*P* and at the same time is not not-*S*. Either then nothing at all is *M*, or what is *M* must be some thing or things of those in which the attributes of *P* and *S* are combined. The conclusion here is particular.

The President of Corpus[1] quotes the following (among other) quasi-syllogisms proposed by Schuppe :—

(i) No M is P (ii) Some M is P
    S is not M Some S is M [or, All S is M]
  $\therefore$ S may be P. $\therefore$ Some S may be P.

Equally, of course, it may not — there is indifferent contingency of the conclusion. So far as there is any inference at all it is in the case of (i) merely this, that the fact of no M being P establishes no presumption against S being P, since S and M are totally unconnected. In the case of (ii) it is argued that the fact of some M being P shows that there is nothing to forbid S (which is in some [or all] cases M, being P. If *no* M were P, then those S's which are mentioned as being M could not possibly be P, though other S's might be.

[1] *Encycl. Brit.*, art. ' Logic.'

APPENDIX I

CAUSE AND SIGN

The Chart given below is intended to illustrate the connexions of Subject and Predicate as Cause and as Sign. Answering to these two relations are the methods of Deductive and of Inductive Reasoning. The counter-relativity of Extension and Intension is also here exhibited. The diagram may be read upwards or downwards.

The dotted lines stand for minor premisses (which in turn become *probanda*). The thick lines for major premisses, which also in turn become *probanda*. Each triangle is a syllogism in *Barbara*, of which the base is the *Concludendum* or *Probandum*.
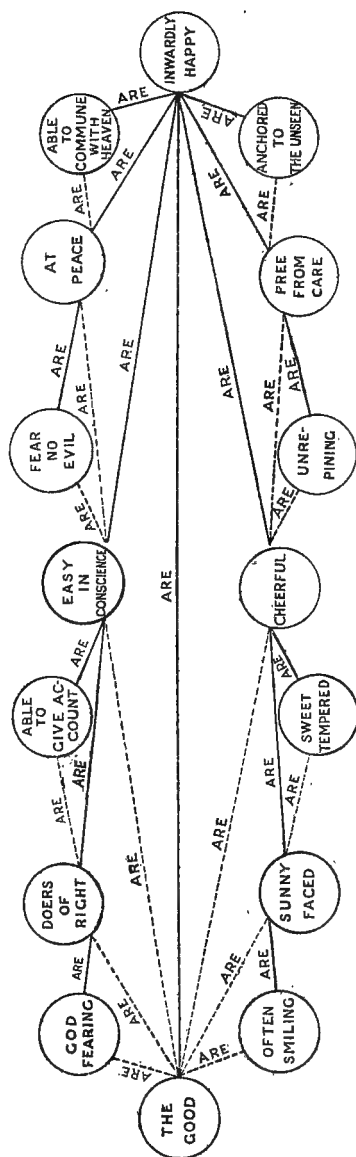
The Good are inwardly Happy.

Inductive reasoning, followed by a Deduction (*ratio essendi*).

I.   A. How is this *fact* to be *accounted for* ?   Because they are easy in conscience (minor), and such are inwardly happy (major).

B. How do you account for their being easy in conscience (minor) ?   Because they are doers of right (sub-minor), and such have easy consciences (sub-major).

C. What makes them doers of right ?   Because they are God-fearing (sub-sub-minor), and such do right (sub-sub-major).

D. What makes doers of right to have an easy conscience ? Because they are able to give account (sub-sub-minor), and such have an easy conscience (sub-sub-major).

E. But now, to return, What makes those whose conscience is at ease to be inwardly happy (major) ?   Because, &c.   (See Chart.)

In the foregoing reasonings a Middle Term is sought as a Cause to account for each alleged fact.   Being given it, we say deductively that the fact *must be*, is *sure* to be, as alleged.   The actual finding of the Middle Term or Cause is the work of Induction, and is a material inquiry, an inquiry into the nature of things, though as involving a reasoning process it has a formal or rational element.

II.   Let us now look below the line.   The triangles here are syllogisms which answer the question, What ground there is for a judgement ? not, What cause there is for a fact ?   The answer is found not, as above, deductively,—'The good have an easy conscience, and such are happy ; therefore they *must be* happy '—but from observed signs (*ratio cognoscendi*).   This is the other side of Induction—the asking what facts a generalization rests upon.   Afterwards from these facts, as signs, the general principle is inferred.

The Good are inwardly Happy.

A. What *ground* is there for this *statement* ?   What makes you say so ?   Because the good are (found to be) cheerful (minor), and cheerfulness is a sign of happiness (major).

B. What ground is there for saying the good are cheerful (minor) ?   Because they (are seen to) have sunny faces (sub-minor), and that is a sign of cheerfulness (sub-major).

C. Why do you say they have sunny faces ?   Because they often smile, and that marks a sunny face [&c.].

D. Why is a sunny face a sign of cheerfulness ?   Because

it goes with sweet-temperedness, which is an indication of cheerfulness.

E. But now, to return, what is the ground for saying that the cheerful are inwardly happy (major)? Because, &c. (See Chart.)

The student is invited to improve upon the above illustrations, and to make pro-syllogisms for himself.

Below the line the middle term sought is some fact of observation. Such facts will be of a less and less general character, until we get to intuitions, whereas *above the line*, each new middle term becomes more and more abstract.

Having found the ground of a statement, the argument is then turned round, and the statement, which was a *probandum* and is now a conclusion, is inferred from the ground, deductively.

All inference is syllogistic. The word Induction is used either to mean the search for middle terms, which is a material inquiry, or else proof from observed signs as contrasted with proof from abstract principles. But the major premiss of every argumentative process must have a certain abstract character. The weakness of the proof from an observed sign is that it ought to be, in the major premiss, not merely an effect, but one that never appears apart from the given cause. Thus, cheerfulness is an invariable sign of inward happiness only if cheerful people are always happy. But a circus clown has to be professionally cheerful, when perhaps he has an only child lying at home at the point of death. In dealing with natural classes, however, we so often find qualities which are *propria*, and which reciprocate with their subject, that the argument from a sign frequently carries conviction.

In the above Chart, in the triangles above the line, any dotted line (representing a fact of experience) may be taken as a base line and made a *probandum*, having the apex of the triangle *below* it for its ground, i. e. the *a posteriori* reason for asserting it. The line opposite to the predicate will then give the observed fact, the other line the general principle or sign (regarding the predicate as a *proprium*). Thus,—What ground is there for saying that the good fear God? This, that they are doers of right, and right-doing is a sign of Godfearingness. Again, in the triangles below the central line, any dotted line may be made a base line, and find its *cause* in the apex of the triangle *above* it. Thus,—What makes the good to be cheerful? This, that they are inwardly happy, and such inward happiness produces cheerfulness.

In a universal affirmative proposition the extension of the predicate is greater than that of the subject, and the intension less. Apart from any question of convertibility between properties and subjects, a glance at the diagram, above the line,

will show how many predicates intervene between 'the good' and 'inwardly happy', and of course the triangles might be multiplied indefinitely. It is the same below the line if we are sure that by 'Cheerfulness is a sign of inward happiness' we mean *all* cheerfulness.

APPENDIX K

IDIOMATIC FORMS

The following are additional illustrations of the propositional A form, Every non-X is Y:—

Vae mihi nisi evangelizavero.
Extra Christum Satanas animam occupat. (Calvin.)
Tout est perdu fors l'honneur.
Animum rege, qui nisi paret imperat.
Without him you are lost.
Perdition seize my soul, but I do love thee.
Offendatur Deus ne (so long as not) contristetur amicus.
Save back to England, all the world's my way.
Absent le chat, les souris dansent.

More common is the E form, No non-X is Y (Every non-X is non-Y).

What's a table richly spread Without a woman at its head ?
Nullum magnum ingenium sine mixtura dementiae.
Get thee to church o' Thursday, or never look me in the face again.
In rufa pelle non est animus sine felle.
If God be not, nothing is. (Hegel.)
Si mundus universus non est Deus, ne stellae quidem.
Nihil ardet in inferno nisi propria voluntas.
The world cannot be governed without laws, and laws without a compulsory signify nothing. (Jer. Taylor.)
Where there is no law there is no transgression.
Nothing's so hard but search will find it out.
Earth has no sorrow that Heaven cannot cure.
Sine cruce sine luce.
Avarus, nisi cum moritur, nil recte facit.
Extra Ecclesiam nulla salus.
There is no world without Verona's walls But **purgatory**, torturing hell itself.
It never rains but it pours.
Shall there be evil, and the Lord hath not done it ?
No smoke without fire.
No rose without a thorn.
None think the great unhappy but the great.
No commonwealth can flourish without learning.

All I don't know is not knowledge.

There's nothing bad but thinking makes it so.

Without revelation men know nothing. (*Pensées.*)

No sermon without Augustine. (Spanish.)

Nihil est in intellectu quod non prius fuerit in sensu. (If we add, 'nisi ipse intellectus,' the formula is, No non-Z non-X is Y.)

On ne se détache jamais sans douleur.

What else is Plato than Moses speaking Attic Greek ?

Without an Ego there is no non-Ego.

Nemo laeditur nisi a se ipso.

If a man strive for masteries, yet is he not crowned except he strive lawfully.

Out of sight out of mind.

Who abstains from meat that is not gaunt ? (Gaunt.) (Or this will illustrate the form, ' No not-X is non-Y.')

A few further examples of the ordinary E judgement, No X is Y, are here given.

Where happiness is, there am I not.

Τίς ὁ σωζόμενος πλούσιος ;

With stupidity even the gods cannot contend.

Venus smiles not in a house of tears.

'Tis not the many oaths that make the truth, &c.

Necessity has no law.

Te docente, nil obscurum.

I dare do all that may become a man ; Who dares do more is none.

Non habet peccatum ideam.

In this place, most master wears no breeches. (Eleanor.)

Never too late to mend.

To-morrow never comes.

Gratia non ligatur mediis.

No two persons think exactly alike.

Use every man after his desert, and who will scape whipping?

Nil desperandum, Teucro duce.

Sint Maecenates, non deerunt, Flacce, Marones.

Uni navi ne committas omnia.

Non amo Te ut salves me.

If they were all one Body, where were then the Body?

May his highness live in freedom and this man out of prison?

One example may be given of a duplex or reciprocating judgement (Hamilton's 'All X is all Y')—He that hath the Son hath life ; he that hath not the Son hath not life.

In the following list of general Affirmative Judgements, the student may usefully cast each proposition in the form, ' Every ZX is Y'—X being the assumed sphere of discourse, and Z the conditioning element (see above, § 487). Such analysis is simple in propositions like 'vis (X) consili expers (Z) mole ruit sua ',

or, 'Least ($\dot{Z}$) said (X) soonest mended,' or, 'All hope abandon ye (X) who enter here (Z),' or, 'florent concordia (Z) regna (X).' But it will exercise thought in some of the following examples of the A form of Universals :—

Dare quam accipere.

Where thou art, there is the world itself.

Woe to that land that's governed by a child.

Timidi est optare necem.

God and one make a majority.

In great cities all men are more or less alike.

Men are nothing ; a man is everything.

Mos pro lege.

One touch of nature makes the whole world kin.

Christmas comes but once a year.

The world is made up of the vulgar.

Cineri gloria sera venit.

Unusquisque, quodcunque fecerit bonum, hoc recipiet a Domino, sive servus sive liber.

Sublata omni quantitate tollitur spatium.

Mihi vivere Christus, mori lucrum est.

If every *one* would mend *one*, we should have a new world.

One man in his time plays many parts.

Unum corpus multi sumus, omnes qui de uno Pane participamus.

Cavil, if it do not find a hole, will make one.

The one remains, the many change and pass.

A little fire is quickly trodden out.

Cuius regio eius religio.

To whom much is forgiven the same loveth much.

Nihil moror colorem, modo gratus sit sapor.

Quanto doctior eo iracundior.

Handsome is as handsome does.

Needs must when the devil drives.

Alius alii subsidium.

Once bitten twice shy.

All work and no play makes Jack a dull boy.

Quisque suos patimur Manes.

Time must friend or end.

Clay and clay differs in dignity, Whose dust is all alike.

Jack's as good as his master.

Of bad the least. (Spanish.)

The rain it raineth every day.

Essex is all flat.

Credo ut intelligam.

'Wisdom and justice and equity are the invariable characteristics of the dealings of the United States.'

Brag's a good dog.

Gentillesse cometh of God alone.

Les Anglois s'amusent tristement.

One sinner destroyeth much good.

Every one that (R. V. whosoever) findeth me shall slay me.

Well begun is half done.

Mighty contests rise from trivial things.

Sal sapit omnia.

Every man is a scoundrel when he is sick.   (Johnson.)

Tout passe ; l'Art seule a l'éternité.

He who serveth God with fear, it is good ; he who serveth Him with love, it is better ; he who with both, that is best of all.

$5 \times 7 = 35.$

A friend is one soul in two bodies.

Enough is as good as a feast.

Genius is always intolerant.

Ἀνδρῶν ἐπιφανῶν πᾶσα γῆ τάφος.

One star differeth from another star in glory.

Bate me some and I will pay you some.

Mundum regunt numeri.

Pessima republica plurimae leges.

Ut ameris ama.

Everybody's business is nobody's business.

Trade follows the flag.

When Caesar says do this, it is performed.   ·

One pain is lessen'd by another's anguish.

Les nerfs, voilà tout l'homme.

Seek ye the Lord while He may be found.

There must be such a thing as an orthodoxy and a deposit of truth, if there is to be a theology.

<p style="text-align:center">Ὅστις ἂν βροτῶν</p>

κακὸς πεφύκῃ ζημιοῦσιν οἱ θεοί.

L'homme ne meurt qu'une fois.

Felicium multi cognati.

Diversos diversa iuvant.

Ingratum si dixeris, omnia dicis.

Inter duas sellas decidimus.

Novus rex nova lex.

Plus vident oculi quam oculus.

Ex ungue leonem.

Tanti quantum habeas fis.

Truditur dies die.

It is the nature of War Offices to be inefficient.

Ut quisque est vir optimus, ita difficillime esse alios improbos suspicatur.

Vitia erunt donec homines.

Μέγα βιβλίον μέγα κακόν.

Assez-tôt, si bien.

Multi societate tutiores.

Multa petentibus desunt multa.

Παθήματα μαθήματα.
Clariora cariora.
Soon hot soon cold.
We mortal millions live alone.
Any stick will do to beat a dog with.
As a man sows, thus shall he reap.
La propriété c'est le vol.
Silet sapit.
Pectus facit theologum.
À la guerre comme à la guerre.
Like people like priest.
They manage things better in France.
Accidents will happen.
Qualis vita finis ita.
Which way I fly is hell, myself am hell.
Near to sword near to God.
More things are wrought by prayer Than this world dreams of.
Remember me when thou comest.
Vetera religio commendat.
Fast-won fast lost.
When Greek meets Greek, then is the tug of war.
There's small choice in rotten apples.
Homo, Deo solo dominante, liberrimus.
Never star Was lost here but it rose afar (no X is non-Y).
Nemo praeter Christum sine peccato (no non-X is non-Y = every non-X is Y).
Is any sick? The Man of Ross relieves.
If two ride one horse, one must ride behind.
The reader is invited to throw the following into symbolic form—'Alia sunt quae nisi intellegantur non credimus, et alia quae nisi credamus non intellegimus'. (Aug.)

VERBAL PARADOXES

The examples given in the text (§§ 48, 133, 134, 236 seq., 512) of verbal paradox may be supplemented by the following :—

An Englishman is never happy unless he is miserable ; a Scotsman never at home unless he is abroad ; an Irishman never at peace unless he is at war.

The way to avoid obstacles is to crush them. (Robespierre.)

Every man has a right to say what he pleases ; and every other man has a right to knock him down for it. (Johnson.)

An Irishman, praising ancient architecture, asked, 'Where do you ever see a modern building that has stood for five centuries?'

Men, said Sancho Panza, are as God made them, and sometimes a great deal worse.

The captains of two St. Lawrence steamers declared that they were not racing, but only trying which could go the faster.

An American politician said he was in favour of the Prohibition Law, but against enforcing it.

'Those, gentlemen,' said another politician, 'are my lifelong convictions, and if they don't please you they can of course be changed.'

Most of the above are really self-contradictory, as much as 'stationary advance'. But the following are merely epigrammatic :—

Busy people have most time.
Lazy people give themselves most trouble.
Lowly pomp.
An aggressive peace-policy.
Tyranny of free thought.
The multitudinous desolation of East London.
A parliament without debate. (The Quakers' Meeting in 'Elia'.)
Obscure notoriety.
The luminous obscure (contrast 'the palpable obscure ').
Darkness visible.
Fanatical in his moderation.
Improvident thrift. (J. Morley.)
Meek implacability.
A foreigner at home. (Johnson. Compare 'intra eadem moenia exilium '.)
An old maid's husband. (George Eliot.)
Sympathetic loneliness.
Nunquam minus solus quam quum solus.
Cruel only to be kind.
Killing the slain.
Our friend the enemy.
Awful mirth. (100th Psalm, Tate and Brady.)
A law of liberty.
A pet aversion.
Brilliant flashes of silence.
Libido tacendi. (Cicero.)
A debauch of unselfishness.
A careless-ordered garden.
Helots of Park-lane.
The only chance of distinction in a democracy is to be undistinguished.
A grave jest.
Insatiate made from mere satiety. (Is. Williams.)
Secret de Polichinelle (an open secret).
Dining with Duke Humphrey (i. e. not at all).
A Newgate pastoral. (Swift.)
Monologue à deux.

A distinction without a difference.

Cruel, irreligious piety.   (*T. Andr.*)

The Colonies responded to the call before it was made.

Cheap labour is dear labour.

Granite on fire (a character).

To be proud in that you are not proud is a phoenix pride. (Manchester al Mondo.)

A deep below the deep, and a height beyond the height ;

Our hearing is not hearing, and our seeing is not sight.

The most of this world spend their days in a serious jesting and busy doing of nothing.   (Baxter.)

' Love's sorwes glade.'   (Gower.)

γενναῖον ψεῦδος.

Magnas inter opes inops.

St. Gregory said of Benedict of Nursia that he was learnedly ignorant and wisely untaught.   The *De Docta Ignorantia*, however, of Nicholas of Cusa (1438) is about educated agnosticism.   This Nicholas has the following analytic judgements in his scheme of church reformation—'The bishop is to oversee, the canon to keep rules, the eremite to be a solitary, the rector to rule, the curate to care for his flock, the cardinals to be the church's hinges'.

An illustration of a name being employed in a changed sense is Homer's use of 'hecatomb' for a sacrifice of *twelve* oxen (*Il.* vi. 93, 115) and for one of eighty-one (*Od.* iii. 59), as well as for a sacrifice of rams (*Il.* i. 315 ; *Od.* i. 25).

As an example of the necessity of mediation between expressions before we can pronounce the one to be implied in, or incompatible with, the other, take such a phrase as 'beneficed curate'.   This may seem as obvious a contradiction in terms as 'unbeneficed incumbent'.   Yet a curate in Prayer Book language means an incumbent.   Few would rule out the phrases 'a farmer owning his own land', or 'a third alternative'.   Yet the former ignores the meaning of 'farmer', and the latter that of 'alter'.   In 'Roman Catholic' the two parts of the expression have been diversely regarded as mutually qualifying, mutually creative, and mutually destructive.   Milton argues that it is 'one of the Pope's bulls : it is particular-universal or catholike-schismatike'.   The late Dr. Liddon, objecting to the phrase 'Episcopal Church', used to say it was like talking of a biped man.   A 'laughing philosopher' is a contradiction in terms, if the conceptions of Johnson's old college friend, Oliver Edwards, were correct—' I have tried too in my time to be a philosopher ; but, I don't know how, cheerfulness was always breaking in '.

But Thought without Middle Terms is at a standstill.   And this is the conclusion of the whole matter.